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KANSAS STATE AGRICULTURAL COLLEGE BULLETIN

VOLUME XII APRIL 1, 1928. NUMBER 5

CATALOGUE

SIXTY-FIFTH SESSION, 1927-'28

WITH ANNOUNCEMENTS FOR 1928-'29

MANHATTAN, KANSAS
Published by the College

PRINTED BY KANSAS STATE PRINTING PLANT
B. P. WALKER, STATE PRINTER
TOPEKA 1928
12-2145

The Kansas State Agricultural College Bulletin is published on the first and fifteenth of each month by the Kansas State Agricultural College, Manhattan, Kan., to which requests for copies of the publication should be addressed. Entered as second-class matter November 6, 1916, at the post office at Manhattan, Kan., under the Act of August 24, 1912.

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1928

JANUARY

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The College Calendar

SUMMER SCHOOL, 1928

June 1, Friday.—Registration of students for Summer School begins at 8 a. m.
June 1, Friday.—Examinations for students deficient in entrance subjects, 8 a. m. to 5 p. m.
June 1 to Aug. 2, Friday to Thursday.—Summer School in session, nine weeks.
June 4 to June 9, Monday to Saturday.—4-H Club Round-up.
June 15, Friday.—Preliminary reports on masters' theses are due.
July 4, Wednesday.—Independence Day, holiday.
July 5 to Aug. 2, Thursday to Thursday.—Second session of Summer School, four weeks.
July 14, Saturday.—Abstracts of masters' theses are due.
July 28, Saturday.—Masters' theses are due.
Aug. 1, Wednesday.—Commencement exercises at 8 p. m. for those graduating at end of first session of Summer School.
Aug. 16, Thursday.—Reports of all grades for first session of Summer School are due in registrar's office.

FIRST SEMESTER, 1928-'29

Sept. 7, Friday.—All members of the instructional force on duty.
Sept. 8, Saturday.—Meeting of assigners with committee on schedule at 2 p. m.
Sept. 8, Saturday.—Meeting of assigners with deans at 3 p. m.
Sept. 10, Monday.—Admission and registration of students begin at 7:45 a. m.
Sept. 10, Monday.—Examinations for students deficient in entrance subjects, 8 a. m. to 5 p. m.
Sept. 12, Wednesday.—Registration of students closes at 9:30 a. m.
Sept. 12, Wednesday.—Opening convocation, 11 a. m. to 12 m.
Sept. 12, Wednesday.—*All classes meet according to schedule, beginning at 1 p. m.
Sept. 12 and 13, Wednesday and Thursday.—† Mental tests for freshmen 1 to 4:30 p. m.
Oct. 6, Saturday.—Examinations to remove conditions.
Oct. 13.—Saturday.—Scholarship deficiency reports to students and deans are due.
Nov. 10, Saturday.—Midsemester scholarship deficiency reports to students and deans are due.
Nov. 15, Thursday.—Preliminary reports on masters' theses are due.
Nov. 28, Wednesday.—Thanksgiving vacation begins at 12 m.
Dec. 1, Saturday.—Thanksgiving vacation closes at 6 p. m.
Dec. 20, Thursday.—Winter vacation begins at 6 p. m.
Jan. 3, 1929, Thursday.—Winter vacation closes at 6 p. m.
Jan. 7, Monday.—Farmers' Short Course and Dairy Manufacturing Short Courses begin.
Jan. 7, Monday.—Abstracts of masters' theses are due.
Jan. 21, Monday.—Masters' theses are due.
Jan. 18 to 26, Friday to Saturday.—Examinations at close of semester.
Jan. 26, Saturday.—First semester closes at 11 a. m.
Jan. 26, Saturday.—Semester scholarship deficiency reports to students and deans are due.

SECOND SEMESTER, 1928-'29

Jan. 28, Monday.—Meeting of assigners with committee on schedule at 2 p. m.
Jan. 28, Monday.—Examinations for students deficient in entrance subjects, 8 a. m. to 5 p. m.
Jan. 29, Tuesday.—Admission and registration of students begin at 7:45 a. m.
Jan. 30, Wednesday.—Registration closes at 5 p. m.
Jan. 31, Thursday.—*All classes meet according to schedule, beginning at 8 a. m.
Feb. 3 to 8, Tuesday to Friday.—Farm and Home Week.
Feb. 9, Saturday.—Reports of all grades for first semester due in registrar's office.
Feb. 22, Friday.—Washington's birthday, holiday.
Feb. 23, Saturday.—Examinations to remove conditions.
Mar. 2, Saturday.—Farmers' Short Course and Dairy Manufacturing Short Courses close at 12 m.
Mar. 2, Saturday.—Scholarship deficiency reports to students and deans are due.
Mar. 15, Friday.—Preliminary reports on masters' theses are due.
Mar. 28, Thursday.—Easter vacation begins at 6 p. m.
Mar. 30, Saturday.—Midsemester scholarship deficiency reports to students and deans are due.
Apr. 1, Monday.—Easter vacation closes at 6 p. m.
Apr. 11, Thursday.—Announcement of elections of seniors to Phi Kappa Phi.
May 6, Monday.—Abstracts of masters' theses are due.
May 14 to 21, Tuesday to Tuesday.—Examinations for seniors.
May 21 to 28, Tuesday to Tuesday.—Examinations at close of semester.
May 22, Wednesday.—Masters' theses are due.
May 26, Sunday.—Baccalaureate services, beginning at 8 p. m.
May 28, Tuesday.—Alumni Day. Business meeting at 2 p. m., banquet at 6 p. m.

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* Students must be present at the first meeting of each class or render a reasonable excuse. Failure to take out an assignment is not accepted as an excuse for absence from classes. A fee of five dollars is charged those who are assigned after the time set for close of registration.

† Required of all freshmen on both days.

May 29, Wednesday.—Commencement Day. Commencement at 10 a. m.
May 31, Friday.—Semester deficiency reports to students and deans are due.
June 13, Thursday.—Reports of all grades for second semester due in registrar's office.

SUMMER SCHOOL, 1929

May 31, Friday.—Registration of students for first session of Summer School begins at 8 a. m.
May 31, Friday.—Examinations for students deficient in entrance subjects, 8 a. m. to 5 p. m.
May 31 to Aug. 1, Friday to Thursday.—First session of Summer School, nine weeks.
June 3 to 8, Monday to Saturday.—4-H Club Round-up.
June 15, Saturday.—Preliminary reports on masters' theses are due.
July 5 to Aug 2, Friday to Friday.—Second session of Summer School, four weeks.
July 15, Monday.—Abstracts of masters' theses are due.
July 27, Saturday.—Masters' theses are due.
July 31, Wednesday.—Commencement exercises at 8 p. m. for those graduating at end of first session of Summer School.
Aug. 20, Thursday.—Reports of all grades for first session of Summer School due in registrar's office.

FIRST SEMESTER, 1929-'30

Sept. 9, Monday.—Admission and registration of students begin at 7:45 a. m.
Sept. 9, Monday.—Examinations for students deficient in entrance subjects, 8 a. m. to 5 p. m.
Sept. 11, Wednesday.—Registration of students closes at 9:30 a. m.

The State Board of Regents

W. Y. MORGAN.	M. G. VINCENT.	B. C. CULP.
C. B. MERRIAM.	EARLE W. EVANS.	MRS. J. S. PATRICK.
CHARLES HARGER.	C. W. SPENCER.	W. E. IRELAND.

H. E. SHRACK, *Business Manager.*
G. W. MYERS, *Assistant Business Manager.*

Administrative Officers of the College

President	F. D. Farrell.
Vice President, and Dean of the Division of General Science	J. T. Willard.
Dean of the Division of Agriculture, and Director of the Agricultural Experiment Station	L. E. Call.
Dean of the Division of Engineering, and Director of the Engineering Experiment Station	R. A. Seaton.
Dean of the Division of Home Economics	Margaret M. Justin.
Dean of the Division of Veterinary Medicine	R. R. Dykstra.
Dean of the Division of College Extension	H. J. Umberger.
Chairman of the Graduate Council	J. E. Ackert.
Dean of Women	Mary P. Van Zile.
Dean of the Summer School	E. L. Holton.
Registrar	Jessie McD. Machir.
Librarian	Arthur B. Smith.
Custodian of Buildings and Grounds	G. R. Pauling.

Officers of Instruction and Administration

PRESIDENT

FRANCIS DAVID FARRELL, Agr. D., President of the College (1918, 1925).*
B. S., Utah Agricultural College, 1907; Agr. D., University of Nebraska, 1925. **A 30; President's House, College Campus.

PROFESSORS

JOHN DANIEL WALTERS, M. S., A. D., Professor of Architecture, Emeritus (1877, 1917).
M. S., K. S. A. C., 1883; A. D., ibid., 1908. E 214; 809 N. Eleventh.

JULIUS TERRASS WILLARD, M. S., Sc. D., Vice President of the College (1883, 1918); Dean of Division of General Science (1883, 1909); Professor of Chemistry (1883, 1901); Consulting Chemist, Agricultural Experiment Station (1888, 1918).
B. S., K. S. A. C., 1883; M. S., ibid., 1886; Sc. D., ibid., 1908. A 48; 1014 Houston.

BENJAMIN LUCE REMICK, Ph. M., Professor and Head of Department of Mathematics (1900).
Ph. B., Cornell College, 1889; Ph. M., ibid., 1892. E 223; 613 Houston.

ALBERT DICKENS, M. S., Professor and Head of Department of Horticulture (1899, 1902); Horticulturist, Agricultural Experiment Station (1899, 1902).
B. S., K. S. A. C., 1893; M. S., ibid., 1901. H 28; 1230 Fremont.

RALPH RAY PRICE, A. M., Professor and Head of Department of History and Government (1903).
A. B., Baker University, 1896; A. M., University of Kansas, 1898. F 57; 615 Humboldt.

JULIUS ERNEST KAMMEYER, A. M., LL. D., Professor and Head of Department of Economics (1903, 1904).
A. B., Central Wesleyan College, 1886; A. M., ibid., 1889; LL. D., Kansas City University, 1912. A 52; 1441 Laramie.

JOHN VANZANDT CORTELYOU, Ph. D., Professor and Head of Department of Modern Languages (1904, 1916).
A. B., University of Nebraska, 1897; A. M., ibid., 1901; Ph. D., University of Heidelberg, 1904. A 71; 325 N. Fourteenth.

JOHN ORR HAMILTON, B. S., Professor and Head of Department of Physics (1901, 1908); Physicist, Engineering Experiment Station (1913).
B. S., University of Chicago, 1900. C 33; 331 N. Fourteenth.

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* One date standing after the title shows when the office was assumed. In the case of two dates separated by a comma or semicolon, the first date indicates when services with the College began, the second when present office was assumed. Dates separated by a dash indicate time of assumption and termination, respectively, of the duties indicated in the title.

** The College buildings are designated by letters, as follows:

A—Anderson Hall (Administration).
Ag—Waters Hall (Agriculture).
Bks—Barracks.
C—Denison Hall (Chemistry, Physics).
CH—College Hospital.
D—Chemistry Annex No. 2.
E—Engineering Hall.
F—Fairchild Hall.
G—Education Hall.
H—Horticultural Hall.
I—Illustrations Hall.
K—Kedzie Hall (Printing).
L—Calvin Hall (Home Economics).
Li—Library.
M—Auditorium.
MA—Music Annex.
N—Nichols Gymnasium.
R—Farm Machinery Hall.
S—Engineering Shops.
T—Thompson Hall (Cafeteria).
V—Veterinary Hall.
VH—Veterinary Hospital.
W—Chemistry Annex No. 1.
X—Maintenance Building.

MARY PIERCE VAN ZILE, Dean of Women (1908, 1918).
Diploma, Iowa State College, 1904. A 40; 800 Houston.

LOWELL EDWIN CONRAD, M.S., Professor and Head of Department of Civil Engineering (1908, 1909); Civil Engineer, Engineering Experiment Station (1913).
B. S., Cornell College, 1904; C. E., ibid., 1906; M. S., Lehigh University, 1908.
E 124; 317 N. Seventeenth.

EDWIN LEE HOLTON, Ph.D., Professor and Head of Department of Education (1910, 1913); Dean of Summer School (1910, 1918).
A. B., Indiana University, 1904; Ph. D., Columbia University, 1927.
G 28A; 217 N. Fourteenth.

ROY ANDREW SEATON, M.S., Dean of Division of Engineering (1904, 1920); Director of the Engineering Experiment Station (1904, 1920).
B. S., K. S. A. C., 1904; M. S., ibid., 1910; S. B., Massachusetts Institute of Technology, 1911. E 115; 722 Humboldt.

ARTHUR BOURNE SMITH, Ph.B., B.L.S., College Librarian (1911).
Ph. B., Wesleyan University, 1900; B. L. S., University of Illinois, 1902.
Li 31; 1503 Fairchild.

LELAND DAVID BUSHNELL, Ph.D., Professor and Head of Department of Bacteriology (1909, 1912); Bacteriologist, Agricultural Experiment Station (1909, 1912).
B. S., Michigan Agricultural College, 1905; M. S., University of Kansas, 1915; Ph. D., Harvard University, 1921. V 54; 801 Osage.

LELAND EVERETT CALL, M.S., Dean, Division of Agriculture (1907, 1925); Director, Agricultural Experiment Station (1907, 1925).
B. S. in Agr., Ohio State University, 1906; M. S., ibid., 1912.
Ag 112; 223 N. Fourteenth.

GEORGE ADAM DEAN, M.S., Professor and Head of Department of Entomology (1902, 1913); Entomologist, Agricultural Experiment Station (1902, 1913).
B. S., K. S. A. C., 1895; M. S., ibid., 1905. F 52; 1725 Poyntz.

ROBERT KIRKLAND NABOURS, Ph.D., Professor and Head of Department of Zoology (1910, 1913); Zoölogist, Agricultural Experiment Station (1910, 1913); Curator of the Natural History Museum (1910).
Ed. B., University of Chicago, 1905; Ph. D., ibid., 1911. F 30; 401 Denison.

RALPH RALPH DYKSTRA, D.V.M., Dean of Division of Veterinary Medicine (1911, 1919); Professor of Surgery and Head of Department of Surgery and Medicine (1911, 1913).
D. V. M., Iowa State College, 1905. V 29; 607 Houston.

MICHAEL FRANCIS AHEARN, M.S., Professor and Head of Department of Physical Education, and Director of Athletics (1904, 1920).
B. S., Massachusetts Agricultural College, 1904; M. S., K. S. A. C., 1913.
N 35; 104 N. Juliette.

CHARLES MOSES SIEVER, Ph.G., M.D., College Physician (1916).
Ph. G., Trinity University, 1903; M. D., ibid., 1903; M. D., University of Kansas, 1907.
A 65; 1719 Laramie.

WALTER WILLIAM CARLSON, B.S., M.E., Professor and Head of Department of Shop Practice (1910, 1917); Superintendent of Shops (1910, 1912); Industrial Engineer, Engineering Experiment Station (1913).
B. S., K. S. A. C., 1908; M. E., ibid., 1916. S 62; 1722 Laramie.

SAMUEL CECIL SALMON, M.S., Professor of Farm Crops (1913, 1917).
B. S., South Dakota Agricultural and Mechanical College, 1907; M. S., K. S. A. C., 1923.
Ag 217; 1648 Leavenworth.

WALTER HORACE BURR, M.S., Professor of Sociology (1914, 1921).
B. S., K. S. A. C., 1920; M. S., University of Missouri, 1927.
A 74; Tatarrax Apt.

HARRY JOHN CHARLES UMBERGER,[1] B.S., Dean of Division of College Extension (1911, 1919); Director of College Extension (1911, 1919).
B. S., K. S. A. C., 1905. A 33; 1412 Leavenworth.

HERBERT HIRAM KING, Ph. D., Professor and Head of Department of Chemistry (1906, 1918); Chemist, Agricultural Experiment Station (1918); Chemist, Engineering Experiment Station (1909, 1918).
B. S., Ewing College, 1904; A. M., ibid., 1906; M. S., K. S. A. C., 1915; Ph. D., University of Chicago, 1918. C 30; 1711 Fairchild.

CHARLES WILBUR MCCAMPBELL, D.V.M., Professor and Head of Department of Animal Husbandry (1910, 1918); Animal Husbandman, Agricultural Experiment Station (1910, 1918).
B. S., K. S. A. C., 1906; D. V. M., ibid., 1910; B. S. in Agr., ibid., 1918.
Ag 15; 343 N. Fourteenth.

RAY IAMS THROCKMORTON, M.S., Professor and Head of Department of Agronomy (1911, 1925); Agronomist, Agricultural Experiment Station (1911, 1925).
B. S. in Agr., Pennsylvania State College, 1911; M. S., K. S. A. C., 1922.
Ag 214; 825 Houston.

JAMES EDWARD ACKERT, Ph. D., Professor of Zoölogy (1913, 1918); Parasitologist, Agricultural Experiment Station (1913).
A. B., University of Illinois, 1909; A. M., ibid., 1911; Ph. D., ibid., 1913.
F 27; 1923 Leavenworth.

ALFRED EVERETT WHITE, M.S., Professor of Mathematics (1909, 1918).
B. S., Purdue University, 1904; M. S., ibid., 1909. A 72; 1743 Fairchild.

JAMES BURGESS FITCH, B.S., Professor and Head of Department of Dairy Husbandry (1910, 1918); Dairy Husbandman, Agricultural Experiment Station (1910, 1918).
B. S., Purdue University, 1910. Ag 151; 321 N. Sixteenth.

HALLAM WALKER DAVIS, A.M., Professor of English (1913, 1918); Head of Department of English (1913, 1921).
A. B., Indiana University, 1909; A. M., Columbia University, 1913.
K 52; 1727 Fairview.

ARAMINTA HOLMAN, B.S., Professor and Head of Department of Applied Art (1913, 1918).
Graduate, New York School of Fine and Applied Art, 1912; B. S., Columbia University, 1922. A 67; 327 N. Fifteenth.

VIVAN LEWIS STRICKLAND, Ph. D., Professor of Education (1917, 1922).
A. B., University of Nebraska, 1906; A. M., ibid., 1915; Ph. D., ibid., 1925.
G 28; 1512 Leavenworth.

JAMES PARK CALDERWOOD, M.E., M.S., Professor and Head of Department of Mechanical Engineering (1918, 1922); Mechanical Engineer, Engineering Experiment Station (1918).
M. E., Ohio State University, 1908; M. S., Pennsylvania State College, 1916.
E 106; 321 N. Fourteenth.

JAMES HENRY BURT, D.V.M., Professor and Head of Department of Anatomy and Physiology (1909, 1919).
V. S., Ontario Veterinary College, 1895; D. V. M., Ohio State University, 1905.
V 32; 800 Poyntz.

LEO EDWARD MELCHERS,[2] M.S., Professor and Head of Department of Botany and Plant Pathology (1914, 1919); Plant Pathologist, Agricultural Experiment Station (1914).
B. S., Ohio State University, 1912; M. S., ibid., 1913. H 58; 1801 Leavenworth.

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1. In coöperation with the U. S. Department of Agriculture.
2. Absent on leave, year 1927-'28.

EDWIN CYRUS MILLER,[3] Ph. D., Professor of Plant Physiology (1910, 1919).
A. B., Lebanon College, 1906; A. B., Yale University, 1907; Ph. D., ibid., 1910.
H 56; 211 N. Eighteenth.

CYRUS VANCE WILLIAMS, B. S., in Agr., Ph. D., Professor of Vocational Education (1920).
B. Ed., (Peru) Nebraska State Normal School, 1909; A. M., University of Nebraska, 1910; B. S. in Agr., College of Agriculture, ibid., 1919; Ph. D., ibid., 1925.
G 29; 611 Humboldt.

WILLIAM HIDDLESON ANDREWS, Ph. D., LL. D., Professor of Education (1906, 1920).
A. B., University of Chicago, 1900; M. S., K. S. A. C., 1919; Ph. D., University of Chicago, 1923; LL. D., College of Emporia, 1921. G 28B; 1704 Fairview.

CHARLES OSCAR SWANSON, M. Agr., Ph. D., Professor and Head of Department of Milling Industry (1906, 1923).
A. B., Carleton College, 1899; M. Agr., University of Minnesota, 1905; Ph. D., Cornell University, 1922. Ag 119; 1640 Fairview.

IVOR VICTOR ILES, A. M., Professor of History and Government (1911, 1920).
A. B., University of Kansas, 1905; A. M., ibid., 1905. F 58; 1725 Fairchild.

JOSIAH SIMSON HUGHES, Ph. D., Professor of Chemistry (1910, 1920).
B. S., Ohio Wesleyan University, 1908; M. S., ibid., 1910; A. M., Ohio State University, 1910; Ph. D., ibid., 1917. C 41; 333 N. Fifteenth.

ROBERT WARREN CONOVER,[4] A. M., Professor of English (1915, 1920).
A. B., Wesleyan University, 1911; A. M., ibid., 1914. K 52; 1729 Fairchild.

JOHN CHRISTIAN PETERSON, Ph. D., Professor of Psychology (1917, 1926).
A. B., University of Utah, 1913; Ph. D., University of Chicago, 1917.
G 33; 1330 Laramie.

FREDERICK ERVING COLBURN, Professor and Head of Department of Illustrations (1919, 1920).
I; 322 N. Seventeenth.

HERBERT FREDERICK LIENHARDT, V. M. D., Professor and Head of Department of Pathology (1917, 1920).
V. M. D., University of Pennsylvania, 1916. V 58; 1118 Bertrand.

GEORGE ELLSWORTH RABURN, M. S., Professor of Physics (1910, 1920).
A. B., University of Michigan, 1907; M. S., ibid., 1913. C 34; College Heights.

ROBERT JOHN BARNETT, M. S., Professor of Horticulture (1920).
B. S., K. S. A. C., 1895; M. S., ibid., 1911. H 33; 1203 Thurston.

HARRY BRUCE WALKER,[5] C. E., Professor and Head of Department of Agricultural Engineering (1914, 1921); Agricultural Engineer, Engineering Experiment Station (1921).
B. S. in C. E., Iowa State College, 1910; C. E., ibid., 1920. E 216; 1728 Fairchild.

MARY THERESA HARMAN, Ph. D., Professor of Zoölogy (1912, 1921).
A. B., Indiana University, 1907; A. M., ibid., 1909; Ph. D., ibid., 1912.
F 41; 1430 Poyntz.

FLOYD WAYNE BELL, B. S. A., Professor of Animal Husbandry, in Charge of Advanced Judging (1918, 1921).
B. S., Cornell University, 1911. Ag 5; 1736 Fairview.

EUSTACE VIVIAN FLOYD, B. S., Professor of Physics (1911, 1921).
B. S., Earlham College, 1903. C 34; 1451 Laramie.

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3. Acting head of department, year 1927-'28.
4. Absent on leave, first semester, 1927-'28.
5. Absent on leave till February 28, 1928; resigned June 30, 1928.

WALDO ERNEST GRIMES, Ph. D., Professor and Head of Department of Agricultural Economics (1913, 1921).
B. S., K. S. A. C., 1913; Ph. D., University of Wisconsin, 1923.
Ag 350; 203 N. Delaware.

JOHN HUNTINGTON PARKER, M. S., Professor of Crop Improvement (1917, 1921).
B. S. in Agr., University of Minnesota, 1913; M. S. in Agr., Cornell University, 1916.
Ag 103; 1728 Fairview.

HOWARD TEMPLETON HILL, J. D., Professor and Head of Department of Public Speaking (1920, 1922).
B. S., Iowa State College, 1910; J. D., University of Chicago, 1917.
G 55; 1020 Leavenworth.

NOBLE WARREN ROCKEY, A. M., Professor of English (1921).
A. B., Ohio State University, 1905; A. M., ibid., 1916. K 52; 514 N. Manhattan.

EDWARD GUERRANT KELLY, M. S., Professor of Entomology, Division of College Extention (1918, 1922).
B. S., University of Kentucky, 1903; M. S., ibid., 1904. F 69; 1621 Humboldt.

HOWARD W. BRUBAKER, Ph. D., Professor of Chemistry (1913, 1922).
B. S., Carleton College, 1899; Ph. D., University of Pennsylvania, 1904.
C 12; 1929 Leavenworth.

PERCY LEIGH GAINEY, A. M., M. S., Professor of Bacteriology (1914, 1922); Soil Bacteriologist, Agricultural Experiment Station (1914).
B. Agr., North Carolina A. and M. College, 1908; M. S., ibid., 1910; A. M., Washington University, 1911; Ph. D., ibid., 1927. V 261; 1123 Houston.

FORREST FAYE FRAZIER, C. E., Professor of Civil Engineering (1911, 1922).
C. E., Ohio State University, 1910. E 123; 1815 Leavenworth.

ROYCE GERALD KLOEFFLER, B. S., Professor and Head of Department of Electrical Engineering (1916, 1927).
B. S. in E. E., University of Michigan, 1913. E 120; 1218 Kearney.

CLINTON ELLIOTT PEARCE, S. B., Professor and Head of Department of Machine Design (1917, 1922).
S. B., Massachusetts Institute of Technology, 1913. E 210; 615 N. Eleventh.

CHARLES HENRY SCHOLER, B. S., Professor and Head of Department of Applied Mechanics (1920, 1922); Engineer of Tests in the Road Materials Laboratory (1920).
B. S., K. S. A. C., 1914. E 11; 806 Bluemont.

LOYAL FREDERICK PAYNE, M. S., Professor and Head of Department of Poultry Husbandry (1921, 1922); Poultry Husbandman, Agricultural Experiment Station (1921, 1922).
B. S., Oklahoma A. and M. College, 1912; M. S., K. S. A. C., 1925.
Ag 245; 4 College Heights Road.

MARTHA S. PITTMAN, A. M., Professor and Head of Department of Food Economics and Nutrition (1919, 1922).
B. S., K. S. A. C., 1906; B. S., Columbia University, 1916; A. M., ibid., 1918.
L 43; 112 S. Twelfth.

GEORGE ALBERT GEMMELL, M. S., Professor of Education, in Charge of Department of Home Study Service, Division of College Extension (1918, 1922).
B. S., Kansas State Teachers College, Pittsburg, 1917; B. S., K. S. A. C., 1920; M. S., ibid., 1922. A 5; 411 N. Sixteenth.

CHARLES WILLIAM BACHMAN, LL. B., Professor of Physical Education (1920, 1922); Head Coach of Athletics (1920).
LL. B., Notre Dame University, 1917. N 30; R. R. 1.

WILLIAM TIMOTHY STRATTON, A. M., Professor of Mathematics (1910, 1923).
A. B., Indiana University, 1906; A. M., ibid., 1913. E 223; 511 N. Sunset.

ROY MONROE GREEN, M. S., Professor of Agricultural Economics (1920, 1923).
B. S. in Agr., University of Missouri, 1914; M. S., K. S. A. C., 1922
Ag 345; 110 S. Seventeenth.

MARGARET M. JUSTIN, Ph. D., Dean of Division of Home Economics (1923).
B. S. in H. E., K. S. A. C., 1909; B. S. in Educ., Teachers' College, Columbia University, 1915; Ph. D., Yale University, 1923. L 29; 531 N. Manhattan.

AMY KELLY, B. S., Professor, State Home Demonstration Leader, Division of College Extension (1923).
B. S., South Dakota State College, 1908. A 36; 1119 Kearney.

HEMAN LAURITZ IBSEN,[13] Ph. D., Professor of Genetics (1919, 1924).
B. S., University of Wisconsin, 1912; M. S., ibid., 1913; Ph. D., ibid., 1916.
Ag 15A; 1116 Bluemont.

ELDEN VALOROUS JAMES, A. M., Professor of History and Government (1912, 1924).
A. B., Marietta College, 1901; A. B., University of Michigan, 1905; A. M., Marietta College, 1908. F 62; 1723 Fairview.

PAUL WEIGEL, B. Arch., Professor and Head of Department of Architecture (1921, 1924).
B. Arch., Cornell University, 1912; Architect, University of State of New York, 1920; Graduate, Buffalo Normal School, 1921. E 302; 1120 Thurston.

LILIAN CLARA WILLIAMS BAKER, A. M., Professor and Head of Department of Clothing and Textiles (1924).
B. S., K. S. A. C., 1914; A. M., University of Chicago, 1921.
L 56; 522 N. Fourteenth.

WALTER GILLING WARD, B. S. Arch., Professor in Charge of Rural Engineering, Division of College Extension (1920, 1925).
B. S. in Arch., K. S. A. C., 1912; Architect, ibid., 1922. E 131; 519 N. Manhattan.

CHARLES ELKINS ROGERS, M. S., Professor and Head of Department of Industrial Journalism (1919, 1926).
A. B., University of Oklahoma, 1914; M. S., K. S. A. C., 1926. K 30; 1740 Fairview.

EDGAR TALBERT KEITH, B. S., Professor of Industrial Journalism and Printing (1912, 1925).
B. S., K. S. A. C., 1912. K 26; 1421 Poyntz.

JAMES WALTER MCCOLLOCH, M. S., Professor of Entomology (1910, 1925); Associate Entomologist, Agricultural Experiment Station (1910, 1918).
B. S., K. S. A. C., 1912; M. S., ibid., 1923. F 83; 1626 Leavenworth.

CHARLES WILLIAM COLVER, Ph. D., Professor of Organic Chemistry (1919, 1925).
B. S., University of Idaho, 1909; M. S., ibid., 1911; Ph. D., University of Illinois, 1919.
C 56; 1635 Fairchild.

CHARLES WALTON MATTHEWS, A. M., Professor of English (1920, 1925).
B. S., Kansas State Teachers College of Pittsburg, 1918; A. M., University of Chicago, 1923. K 52; 1716 Fairview.

MARTHA MORRISON KRAMER, Ph. D., Professor of Food Economics and Nutrition (1922, 1925).
B. S., University of Chicago, 1916; A. M., Columbia University, 1920; Ph. D., ibid., 1922.
L 43; 1740 Fairview.

JULES HENRY ROBERT, B. S., Professor of Applied Mechanics (1916, 1925).
B. S., University of Illinois, 1914. E 113; 1729 Fairchild.

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13. Absent on leave, March 25 to June 25, 1928.

JAMES MARSHALL PETTY, Lieut. Col. Inf., U. S. A., Professor and Head of Department of Military Science and Tactics (1926).

Graduate, Infantry and Cavalry School, Fort Leavenworth, 1903; Graduate, Infantry School, Fort Bennington, 1925; Graduate, Command and General Staff School, Fort Leavenworth, 1926. N 26; 1503 Leavenworth.

HARRY WINFIELD CAVE, M. S., Professor of Dairy Husbandry (1918, 1926).

B. S. A., Iowa State College, 1914; M. S., K. S. A. C., 1916. Ag 151; 1638 Osage.

LOUIS COLEMAN WILLIAMS, B. S., Professor of Horticulture, Division of College Extension (1915, 1926).

B. S., K. S. A. C., 1912; B. S., ibid., 1922. A 34; 1116 Bluemont.

ROGER CLETUS SMITH, Ph. D., Professor of Entomology (1920, 1926).

A. B., Miami University, 1911; A. M., Ohio State University, 1915; Ph. D., Cornell University, 1917. F 55; 1605 Leavenworth.

EDWIN JACOB FRICK, D. V. M., Professor of Medicine (1919, 1926).

D. V. M., Cornell University, 1917. VH 54; 319 N. Sixteenth.

ALFRED EVAN ALDOUS, B. S., Professor of Pasture Management (1926).

B. S., Utah Agricultural College, 1910. Ag 216; 200 N. Sixteenth.

LOUIS HENRY LIMPER, A. M., Professor of Modern Languages (1921, 1926).

A. B., Baldwin Wallace College, 1907; A. M., University of Wisconsin, 1914. A 69; 1324 Laramie.

HENRY ARTHUR SHINN, J. D., Professor of Public Speaking (1923, 1926).

A. B., University of Kansas, 1916; J. D., Leland Stanford University, 1926. G 55; 1715 Fairview.

HELEN WHEELER FORD, Ph. D., Professor and Head of Department of Household Economics (1926).

B. S., Rhode Island State College, 1914; Ph. D., Yale University, 1925. L 42; 531 N. Manhattan.

WILLIAM LINDQUIST, B. M., Professor of Voice and Head of Department of Music (1925, 1927).

B. M., Cosmopolitan School of Music and Dramatic Art, Chicago, 1925. M 33; 1213 Kearney.

FLOYD PATTISON, B. S., Professor of Mechanical Engineering, Home Study Service, Division of College Extension (1919; July 1, 1927).

B. S., K. S. A. C., 1912. A 5; 805 Kearney.

BEATTY HOPE FLEENOR, M. S., Professor of Education, Home Study Service, Division of College Extension (1923; July 1, 1927).

B. S., K. S. A. C., 1919; M. S., ibid., 1923. A 5; 1635 Osage.

MAYNARD HENRY COE, B. S., Professor, State Club Leader, Division of College Extension (1922; July 1, 1927).

B. S., University of Minnesota, 1917. A 35; 336 N. Sixteenth.

WILMER ESLA DAVIS, A. B., Professor of Botany (1909; Sept. 1, 1927).

Graduate, Ohio Normal University, 1894; A. B., University of Illinois, 1903. H 76; 513 N. Sixteenth.

ADA RICE, M. S., Professor of English (1899; Sept. 1, 1927).

B. S., K. S. A. C., 1895; M. S., ibid., 1912. A 61; 917 Osage.

MANFORD W. FURR, C. E., Professor of Civil Engineering (1917; Sept. 1, 1927).

B. S. in C. E., Purdue University, 1913; C. E., ibid., 1925; M. S., K. S. A. C., 1926. E 112; 1426 Humboldt.

JACOB OLIN FAULKNER, A. M., Professor of English (1922; Sept. 1, 1927).

A. B., Washington and Lee University, 1907; A. M., Pennsylvania State College, 1920. K 52; 1720 Fairview.

HERBERT HENLEY HAYMAKER, Ph. D., Professor of Botany (1917; Sept. 1, 1927).
B. S., K. S. A. C., 1915; M. S., University of Wisconsin, 1916; Ph. D., ibid., 1927.
H 54; 315 N. Sixteenth.

ARTHUR BRADLEY SPERRY, B.S., Professor of Geology (1921; Sept. 1, 1927).
B. S., University of Chicago, 1919. F 5; 1116 Bluemont.

ASSOCIATE PROFESSORS

GRACE EMILY DERBY, A.B., Associate Librarian (1911, 1918).
A. B., Western College for Women, 1905. L 55; 1825 Leavenworth.

INA FOOTE COWLES, B.S., Associate Professor of Clothing and Textiles (1902, 1918).
B. S., K. S. A. C., 1901. L 55; 513 N. Sixteenth.

MALCOLM CAMERON SEWELL, Ph. D., Associate Professor of Soils (1914, 1920).
B. S., K. S. A. C., 1912; Ohio State University, 1914; Ph. D., University of Chicago, 1922. Ag 213; 315 N. Fifteenth.

WILLIAM HENRY SANDERS, M. E., Associate Professor of Agricultural Engineering (1914, 1920).
B. S., K. S. A. C., 1890; M. E., ibid.. 1916. R 28; 1208 Kearney.

CARL G. ELLING, B.S., Associate Professor of Animal Husbandry, Division of College Extension (1918, 1921).
B. S., K. S. A. C., 1904. A 33; R. R. 1.

ALONZO FRANKLIN TURNER,[1] B.S., Associate Professor, Field Agent, Division of College Extension (1917, 1920).
B. S., K. S. A. C., 1905. A 2; 810 Moro.

JAMES WALTER ZAHNLEY, M.S., Associate Professor of Farm Crops (1915, 1921).
B. S., K. S. A. C., 1909; M. S., ibid., 1926. Ag 314; Route 8.

HILMER HENRY LAUDE, M.S., Associate Professor of Agronomy (1920, 1921).
B. S., K. S. A. C., 1911; M. S., Texas A. and M. College, 1918.
Ag 202; 326 N. Sixteenth.

JOSEPH PRESTWICH SCOTT, D.V.M., Associate Professor of Pathology (1916, 1921).
B. S., Scientific Gymnasium, Lausanne, Switzerland, 1910; D. V. M., Ohio State University, 1914; M. S., K. S. A. C., 1924. V 2; 1626 Laramie.

WILLIAM MAX MCLEOD, D.V.M., Associate Professor of Anatomy (1919, 1921).
D. V. M., Iowa State College, 1917. V 32; 1114 Bertrand.

FRANK CALEB GATES, Ph. D., Associate Professor of Botany (1919, 1921).
A. B., University of Illinois, 1910; Ph. D., University of Michigan, 1912.
H 57; 1515 Humboldt.

ELSIE HARRIET SMITH, Associate Professor of Piano (1917, 1922).
Graduate, Certificate Course, Chicago Musical College, 1909; Postgraduate Diploma, Institute of Musical Art, New York City, 1914. M 58; 1704 Fairview.

ALBERT JOHN MACK, M.E., Associate Professor of Mechanical Engineering (1917, 1922).
B. S., K. S. A. C., 1912; M. E., ibid., 1921. E 109; 1619 Osage.

ELLIS ADOLPH STOKDYK, M.S., Associate Professor of Agricultural Economics, Marketing Specialist, Division of College Extension (1921, 1924).
B. S., University of Wisconsin, 1920; M. S., K. S. A. C., 1924.
Ag 347; 1617 Leavenworth.

1. In coöperation with the U. S. Department of Agriculture.

EDGAR LEMUEL TAGUE, A. M., Ph. D., Associate Professor of Chemistry (1914, 1923); Assistant in Protein Chemistry, Agricultural Experiment Station (1914).

A. B., University of Kansas, 1908; A. M., ibid., 1909; Ph. D., ibid., 1924.
C 3; 321 N. Delaware.

BERNARD MARTIN ANDERSON, B. S. in Ag., Associate Professor of Animal Husbandry (1920, 1923).

B. S. in Ag., K. S. A. C., 1916, 1923. Ag 24; 323 Yuma.

HARRY ERNEST REED, B. S. in Agr., Associate Professor of Animal Husbandry (1923).

B. S. in Ag., University of Missouri, 1914. Ag 27; 1119 Laramie.

WILLIAM RAYMOND BRACKETT, A. B., Associate Professor of Physics (1919, 1923).

A. B., University of Colorado, 1905. C 38; 1824 Humboldt.

GABE ALFRED SELLERS, B. S., Associate Professor of Shop Practice (1919, 1923).

B. S., K. S. A. C., 1917. S 62; 927 Moro.

HARRISON BOYD SUMMERS, A. M., Associate Professor of Public Speaking (1923).

A. B., Fairmont College, 1917; A. M., University of Oklahoma, 1921.
G 55; 1645 Laramie.

DON CAMERON WARREN, Ph. D., Associate Professor of Poultry Husbandry (1923).

A. B., Indiana University, 1914; A. M., ibid., 1917; Ph. D., Columbia University, 1923.
Ag 249; 1616 Osage.

EARL BOOTH WORKING, Ph. D., Associate Professor of Milling Industry (1923).

A. B., University of Denver, 1917; A. M., ibid., 1919; Ph. D., University of Arizona, 1922.
Ag 120; 918 N. Tenth.

ERNEST BLAINE WELLS, M. S., Associate Professor of Soils, Division of College Extension (1920, 1924).

B. S. A., West Virginia University, 1917; M. S., K. S. A. C., 1922.
Ag 59; 1615 Leavenworth.

ALFRED LESTER CLAPP, B. S., Associate Professor of Agricultural Extension (1920, 1924); District Agent, Division of College Extension (1920, 1924).

B. S., K. S. A. C., 1914. A 2; 1109 Kearney.

GEORGE EDWIN JOHNSON, Ph. D., Associate Professor of Zoölogy (1924); Mammalogist, Agricultural Experiment Station (1924).

B. S., Dakota Wesleyan University, 1913; M. S., University of Chicago, 1916; Ph. D., Harvard University, 1923. F 7; 1614 Humboldt.

PAUL PORTER BRAINARD,[2] A. M., Associate Professor of Psychology (1919, 1924).

B. L., Whitman College, 1909; A. M., Columbia Universtiy, 1913.
G 33A; 1224 Thurston.

ALLAN PARK DAVIDSON, M. S., Associate Professor of Vocational Education (1919, 1924).

B. S., K. S. A. C., 1914; M. S., ibid., 1925. G 29; 1600 Humboldt.

FLORIAN ARTHUR KLEINSCHMIDT, M. Arch., Associate Professor of Architecture (1923, 1924).

B. S. in Arch., University of Minnesota, 1920; M. Arch., Harvard University, 1922; diploma, Ecole des Beaux Arts Americain-Fontainebleau, 1925. E 304; 1130 Houston.

CHRISTOPHER DUDLEY PEIRCE, Major C. A. C., U. S. A., Associate Professor of Military Science and Tactics (1924).

Graduate, Coast Artillery School, 1915; Graduate, Advanced Course, ibid., 1923; Graduate, Command and General Staff School, 1924.

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2. Absent on leave, year 1927-'28.

IRA NICHOLS CHAPMAN, M.S., Associate Professor of Agricultural Economics, Division of College Extension (1922, 1925).
B. S., K. S. A. C., 1916; M. S., ibid., 1926. Ag 345; 1210 Thurston.

WILLARD HUNGATE MARTIN, M.S., Associate Professor of Dairy Husbandry (1925).
B. S., Purdue University, 1918; M. S., Pennsylvania State College, 1922.
Ag 151; 1615 Osage.

IGNATIUS ALBERT WOJTASZAK, B.S., Associate Professor of Applied Mechanics (1920, 1925).
B. S., University of Michigan, 1920. E 208; 931 Leavenworth.

FLOYD ALONZO SMUTZ,[2] B.S., Associate Professor of Machine Design (1918, 1925).
B. S. in Arch., K. S. A. C., 1914. S 51; 1530 Pierre.

MERRILL AUGUSTUS DURLAND, M.S., M.E., Associate Professor of Mechanical Drawing (1919, 1925); Assistant Dean of Division of Engineering (1919, 1926).
B. S., K. S. A. C., 1918; M. E., ibid., 1922; M. S., ibid., 1923.
E 116; 1715 Houston.

RUTH MORRIS, A.M., Associate Professor of Physical Education for Women (1923, 1925).
A. B., University of Wisconsin, 1915; A. M., Columbia University, 1920.
N 3; 1715 Anderson.

HARRY KING LAMONT, Associate Professor of Violin (1922, 1925).
M 58; 624 Houston.

FRANK LESLIE DULEY, Ph.D., Associate Professor of Soils (1925).
B. S., University of Missouri, 1914; A. M., ibid., 1915; Ph. D., University of Wisconsin, 1923. Ag 216; 1814 Laramie.

EARLE REED DAWLEY, M.S., Associate Professor of Applied Mechanics (1920, 1926); Assistant Engineer of Tests (1920).
B. S., University of Illinois, 1919; M. S., K. S. A. C., 1927. E 14; 1200 Kearney.

RUDOLPH DRIFTMIER, M.S., Associate Professor of Agricultural Engineering (1920, 1926).
B. S. in A. E., Iowa State College, 1920; M. S., K. S. A. C., 1926.
E 216; 335 N. Fifteenth.

MORRIS EVANS, M.S., Associate Professor of Agricultural Economics (1920, 1926).
B. S. in Agr., K. S. A. C., 1920; M. S., ibid., 1925. Ag 348; 1601 Poyntz.

MAYNARD WILSON BROWN, M.S., Associate Professor of Industrial Journalism (1925, 1926).
B. S. in Agr. Jour., University of Wisconsin, 1923; M. S., ibid., 1924.
K 33A; 617 Houston.

RALPH LANGLEY PARKER, Ph.D., Associate Professor of Agriculture and Entomology (1925, 1926).
B. S., Rhode Island State College, 1915; Sc. M., Brown University, 1917; M. S., Iowa State College, 1922; Ph. D., Cornell University, 1925. F 82; 1614 Humboldt.

JESSE LAMAR BRENNEMAN, E.E., Associate Professor of Electrical Engineering (1920, 1926).
B. S., University of Chicago, 1908; E. E., University of Wisconsin, 1913.
E 120; Route 8.

HELEN ELIZABETH ELCOCK, A.M., Associate Professor of English (1920, 1926).
A. B., College of Emporia, 1907; A. M., University of Chicago, 1921.
A 63A; 513 N. Sixteenth.

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2. Absent on leave, year 1927-'28.

EMMA HYDE, A. M., Associate Professor of Mathematics (1920, 1926).
A. B., University of Kansas, 1912; A. M., University of Chicago, 1916. A 58; 320 N. Fifteenth.

CLARENCE FLAVIUS LEWIS, M. S., Associate Professor of Mathematics (1920, 1926).
A. B., University of Denver, 1913; M. S., K. S. A. C., 1925. E 223; 1615 Humboldt.

ANNA MARIE STURMER,[12] A. M., Associate Professor of English (1920, 1926).
A. B., University of Nebraska, 1917; A. M., ibid., 1920. A 53; 1636 Fairchild.

CHARLES MECLAIN CORRELL, Ph. M., Associate Professor of History and Government (1922, 1926); Assistant Dean, Division of General Science (July 1, 1927).
B. S., K. S. A. C., 1900; Ph. D., University of Chicago, 1907; Ph. M., ibid., 1908. F 64 and A 49; 1621 Fairchild.

THOMAS JOEL ANDERSON, JR., A. M., Associate Professor of Economics (1922, 1926).
B. S., University of Missouri, 1922; A. M., ibid., 1923. A 74; 1420 Laramie.

EUGENE CLAYTON GRAHAM, B. S., Associate Professor of Shop Practice (1922, 1926).
B. S., Carleton College, 1898; B. S. in M. E., University of Minnesota, 1902. S 36; Route 1.

WALDO HIRAM LYONS, A. M., Associate Professor of Mathematics (1924, 1926).
A. B., University of Denver, 1912; A. M., ibid., 1916. E 223; 820 Moro.

LUCILE OSBORN RUST, M. S., Associate Professor of Education (1924, 1926).
B. S., Kansas State Teachers College, Pittsburg, 1921; M. S., K. S. A. C., 1925. G 29; 710 Humboldt.

AUGUSTIN WILBER BREEDEN, A. M., Associate Professor of English (1926).
Ph. B., University of Chicago, 1924; A. M., ibid., 1925. K 52; 1728 Laramie.

MARGARET S. CHANEY, Ph. D., Associate Professor of Food Economics and Nutrition (1926).
Ph. B. in Ed., University of Chicago, 1914; A. M., University of California, 1923; Ph. D., University of Chicago, 1925. L 47; 1109 Kearney.

FRED ALBERT SHANNON, Ph. D., Associate Professor of History and Government (1926).
A. B., Indiana State Normal School, 1914; A. M., Indiana University, 1918; Ph. D., University of Iowa, 1924. F 60; 301 Bluemont.

DWIGHT WILLIAMS, A. M., LL. B., Associate Professor of History and Government (1926).
A. B., University of Minnesota, 1916; LL. B., ibid., 1918; A. M., ibid., 1926. F 61; 615 Humboldt.

LUTHER EARL WILLOUGHBY, B. S., Associate Professor of Farm Crops, Division of College Extension (1917, 1927).
B. S., K. S. A. C., 1912; B. S. in Agr., ibid., 1916. Ag 250; 918 Thurston.

HARLAN RANDOLPH SUMNER, A. M., Associate Professor of Farm Crops, Division of College Extension (1923, 1927).
B. S., K. S. A. C., 1916; A. M., University of Missouri, 1917. Ag 250; 1723 Leavenworth.

WALTER LEROY LATSHAW, M. S., Associate Professor of Chemistry (1914; July 1, 1927).
B. S., Pennsylvania State College, 1912; M. S., K. S. A. C., 1922. C 3; 927 Fremont.

JAMES HENDRIX MCADAMS,[6] B. S., Associate Professor of Poultry Husbandry, Division of College Extension (1922; July 1, 1927-Dec. 31, 1927).
B. S., K. S. A. C., 1916 and 1923.

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6. Resigned.

12. Absent on leave, second semester, 1927-'28.

ARTHUR CECIL FAY, M.S., Associate Professor of Bacteriology (1921; July 1, 1927).
B. S., University of Missouri, 1920; M. S., University of Wisconsin, 1921. V 28; 1621 Leavenworth.

HAROLD ALLEN,[7] M.S., Associate Professor of Applied Mechanics (1921; July 1, 1927); Assistant Engineer of Tests (1924).
B. S. in C. E., University of Colorado, 1920; C. E., ibid., 1927; M. S., K. S. A. C., 1927. E 16; 1916 Leavenworth.

ADA GRACE BILLINGS, M.S., Associate Professor of History and Government, Home Study Service, Division of College Extension (1921; July 1, 1927).
B. S., K. S. A. C., 1916; M. S., ibid., 1927. A 5; 714 Moro.

MARCIA HALL, A.B., Associate Professor of English, Home Study Service, Division of College Extension (1923; July 1, 1927).
A. B., University of Wisconsin, 1914. A 5; 1626 Laramie.

JAMES WALTER LINN, B.S., Associate Professor of Dairy Husbandry, Division of College Extension (1923; July 1, 1927).
B. S., K. S. A. C., 1915. Ag 147; R. R. 2.

EARL MILO LITWILLER, M.S., Associate Professor of Horticulture, Home Study Service, Division of College Extension (1924; July 1, 1927).
B. S., K. S. A. C., 1915; M. S., ibid., 1926. A 5; 916 Vattier.

ELMA RUTH STEWART IBSEN, M.S., Associate Professor of Institutional Economics and Director of the College Cafeteria (1924; July 1, 1927).
B. S., K. S. A. C., 1921; M. S., ibid., 1925. T 29; 530 N. Fourteenth.

HUGH DURHAM, A.M., Assistant Dean, Division of Agriculture (1915; July 1, 1927); Assistant Director, Agricultural Experiment Station (1915; July 1, 1927); Associate Professor of Agricultural Education (July 1, 1927).
Graduate, Kansas State Teachers College, Emporia, 1901; A. B., University of Kansas, 1909; A. M., ibid., 1915. Ag 109; 730 Osage.

LEON VINCENT WHITE, C.E., M.S., Associate Professor of Civil Engineering (1918; Sept. 1, 1927).
B. S., K. S. A. C., 1903; C. E., ibid., 1918; M. S., ibid., 1927. E 112; 1832 Anderson.

NORA ELIZABETH DALBEY, A.M., Associate Professor of Botany and Plant Pathology (1918; Sept. 1, 1927).
A. B., University of Kansas, 1913; A. M., ibid., 1914. H 54; 1424 Fairchild.

ERNEST BAKER KEITH, Ph.D., Associate Professor of Chemistry (1918; Sept. 1, 1927).
B. S., K. S. A. C., 1913; Ph. D., University of Chicago, 1924. W 27; 1719 Fairchild.

RUSSELL MARION KERCHNER, M.S., Associate Professor of Electrical Engineering (1922; Sept. 1, 1927).
B. S., University of Illinois, 1922; M. S., K. S. A. C., 1927. E 121; 512 N. Denison.

ARTHUR FREMONT BOWEN, Capt. Inf. U. S. A., Associate Professor of Military Science and Tactics (1925; Sept. 1, 1927). N 26; 1440 Laramie.

BENJAMIN SPIETH, M.E., Associate Professor of Applied Mechanics (1926; Sept. 1, 1927).
B. S. in M. E., University of Nebraska, 1916; M. E., University of Wisconsin, 1921. E 113; 514 N. Seventeenth.

WILSON FORREST BROWN, M.S., Associate Professor of Chemistry (Feb. 1, 1928).
B. Ch. E., Ohio State University, 1916; M. S., ibid., 1926. C; 1116 Bluemont.

7. Absent on leave, November 1, 1927, to June 30, 1928.

ASSISTANT PROFESSORS

DANIEL EMMETT LYNCH, Assistant Professor of Forging (1914, 1920); Foreman of Blacksmith Shop (1914).
S 38; 1528 Pierre.

EDWARD C. JONES, M. E., Assistant Professor of Shop Practice (1916, 1920).
B. M. E., Iowa State College, 1905; M. E., ibid., 1922. S 32; 1031 Kearney.

CLIFF ERRETT AUBEL, M. S., Assistant Professor of Animal Husbandry (1919, 1920).
B. S., Pennsylvania State College, 1915; M. S., K. S. A. C., 1917.
Ag 13; 323 N. Fifteenth.

ELIZABETH HAMILTON DAVIS, A. B., B. L. S., Reference Librarian (1920).
A. B., Illinois Women's College, 1909; B. L. S., University of Illinois, 1914.
Li 51; 1224A Moro.

LAWRENCE WILLIAM HARTEL, M. S., Assistant Professor of Physics (1920).
A. B., Central Wesleyan College, 1911; B. S., ibid., 1912; B. S. in Ed., University of Missouri, 1915; M. S., K. S. A. C., 1924. C 57; 1026 Vattier.

GEORGE W. SALISBURY, B. S., Assistant Professor of Agricultural Extension (1919, 1921); District Agent, Division of College Extension (1919, 1924).
B. S., University of Illinois, 1915. A 2; 312 N. Sixteenth.

WILLIAM FRANCIS PICKETT, M. S., Assistant Professor of Horticulture (1917, 1921).
B. S., K. S. A. C., 1917; M. S., ibid., 1923. H 33; 1622 Osage.

CHARLES HOWARD KITSELMAN, V. M. D., Assistant Professor of Pathology (1919, 1921).
V. M. D., University of Pennsylvania, 1918. V 55A; 1417 Pierre.

ROBERT GORDON, Assistant Professor of Music (1921).
Diploma in Theory and Band Instruments, School of Music, University of Michigan, 1920.
M 30; 1414 Humboldt.

CHARLES DEFOREST DAVIS, M. S., Assistant Professor of Farm Crops (1921).
B. S., K. S. A. C., 1921; M. S., ibid., 1926. Ag 309; 1013 Laramie.

EUGENE SIDNEY LYONS, M. S., Assistant Professor of Soils (1920, 1922).
B. S., K. S. A. C., 1921; M. S., ibid., 1925. Ag 216; 1124 Laramie.

DAVID LESLIE MACKINTOSH, M. S., Assistant Professor of Animal Husbandry (1921, 1922).
B. S., University of Minnesota, 1920; M. S., K. S. A. C., 1926.
Ag 13; 1425 Humboldt.

WILLIAM ALEXANDER VAN WINKLE, Ph. D., Assistant Professor of Chemistry (1922, 1923).
B. S., University of Michigan, 1911; M. S., University of Illinois, 1917; Ph. D., ibid., 1920. D 30; 1110 Thurston.

JOSEPH LOWE HALL, Ph. D., Assistant Professor of Chemistry (1922, 1923).
B. S., University of Illinois, 1919; M. S., ibid., 1921; Ph. D., ibid., 1922.
C 10; 1131 Kearney.

FRANK JACOBS CHEEK, JR., C. E., Assistant Professor of Structural Design (1923).
A. B., Center College, 1914; C. E., Rensselaer Polytechnic Institute, 1919.
E 304; 1109 Thurston.

CHARLES WILLIAM CORSAUT, Assistant Professor of Physical Education (1923).
Graduate, Y. M. C. A. College, 1917. N 36; 1601 Humboldt.

IRA KAULL LANDON, B. S. in Agr., Assistant Professor of Agronomy (1923).
B. S. in Agr., K. S. A. C., 1921. Ag 201; 1322 Corning, Parsons, Kan.

WELCOME PORTER WALTZ, Capt. Inf., U. S. A., Assistant Professor of Military Science and Tactics (1923).
Graduate, Infantry School, 1922. N 26; 726 Bertrand.

FRANK OTTO BLECHA, M.S., Assistant Professor of Agricultural Extension; District Agricultural Agent, Division of College Extension (1919, 1923).
B. S., K. S. A. C., 1918; M. S., ibid., 1926. A 2; 1507 Leavenworth.

RUTH HARTMAN, Assistant Professor of Music (1924).
Graduate, Department of Public School Music, Iowa State Teachers College, 1912; Two-year Certificate, Northwestern University, 1923. M 53; 830 Bertrand.

WALTER BUSWELL BALCH, M.S., Assistant Professor of Horticulture (1921, 1924); Greenhouse Foreman (1921).
B. S., Cornell University, 1919; M. S., K. S. A. C., 1925. H 33; R. R. 1.

HOWARD HAROLD STEUP, M.S., Assistant Professor of Poultry Husbandry (1922, 1924).
B. S., Purdue University, 1919; M. S., K. S. A. C., 1925. Ag 252; R. R. 1.

EDGAR MCCALL AMOS, B.S., Assistant Professor of Industrial Journalism and Printing (1920, 1924).
B. S., K. S. A. C., 1902. K 31; 1015 Leavenworth.

ERIC ROSS LYON, M.S., Assistant Professor of Physics (1921, 1925).
A. B., Phillips University, 1911; M. S., ibid., 1923. C 61; 1026 Bertrand.

MINNA ERNESTINE JEWELL, Ph.D., Assistant Professor of Zoölogy (1922, 1924).
A. B., Colorado College, 1914; A. M., University of Illinois, 1915; Ph. D., ibid., 1918. F 39; 1311 Laramie.

GERALD WOODWARD FITZGERALD, D.V.M., Capt., V.C., U. S. A., Assistant Professor of Military Science and Tactics (1924).
D. V. M., K. S. A. C., 1916. V 27; 400 Houston.

CLARICE MARIE PAINTER, Assistant Professor of Piano (1924).
Diploma in Piano, Hardin College, 1919; Diploma, New England Conservatory of Music, 1922. M 51; 1601 Fairchild.

FRANK PLETCHER ROOT, M.S., Assistant Professor of Physical Education and Athletics (1924).
B. S., K. S. A. C., 1914; M. S., ibid., 1924. N 35; 901 Bertrand.

RILEY EDWARD MCGARRAUGH, B.S., Captain C.A.C., U. S. A., Assistant Professor of Military Science and Tactics (1924).
B. S., K. S. A. C., 1917. N 26; 830 Bertrand.

WILLIAM WARREN WERTZ, A.B., Capt. C.A.C., U. S. A., Assistant Professor of Military Science and Tactics (1924).
A. B., Doane College, 1916; Graduate, Coast Artillery School, 1924. N 26; 1605 Pierre.

CLAUDE KEDZIE SHEDD, B.S. in A.E., Assistant Professor of Rural Engineering, Division of College Extension (1925).
B. S. in Agr., University of Nebraska, 1909; B. S. in A. E., Iowa State College, 1914. E 131; 914 Moro.

ALFRED THOMAS PERKINS, Ph.D., Assistant Professor of Chemistry (1925).
B. S., Pennsylvania State College, 1920; M. S., Rutgers College, 1922; Ph. D., ibid., 1923. C 4; 1616 Humboldt.

HARRY WORKMAN AIMAN, A.B., Assistant Professor of Woodwork (1918, 1925).
A. B., Oskaloosa College, 1921. S 29B; 1200 Bertrand.

ROBERT HENRY LUSH, M.S., Assistant Professor of Dairy Husbandry (1923, 1925).
B. S., K. S. A. C., 1921; M. S., University of Minnesota, 1923. Ag 145; 1616 Osage.

GENEVA GRACE WATSON,[2] B. S., Assistant Professor of Physical Education for Women (1923, 1925).
B. S., University of Chicago, 1921. N 1; 1715 Anderson.

HAZLEY THOMAS GROODY, M. D., Assistant Physician, Department of Student Health (1925).
B. S., Valparaiso University, 1909; M. D., Chicago College of Medicine and Surgery, 1913. A 59; 514 N. Juliette.

EDWIN DONALD SAYRE, M. B., Assistant Professor of Voice (1925).
A. B., DePauw University, 1923; M. B., School of Music, ibid., 1925.
M 54; 1230 Vattier.

JULES V. SIMS, First Lieut. Inf., U. S. A., Assistant Professor of Military Science and Tactics (1925).
N 26; 431 Leavenworth.

MARY ABIGAIL WORCESTER, M. S., Assistant Professor of Home Economics, in Charge of Specialists in Home Economics, Division of College Extension (1925).
B. S., University of New Hampshire, 1917; M. S., K. S. A. C., 1924.
A 36; 1649 Fairchild.

LOUIS PIERCE WASHBURN, M. P. E., Assistant Professor of Physical Education for Men (1926).
B. S., Carleton College, 1907; B. P. E., Y. M. C. A. College, 1911; M. P. E., ibid., 1926. N 36; 1700 Laramie.

CHESTER EUGENE GRAVES, B. S., Assistant Professor of Plant Pathology, Division of College Extension (1921, 1926).
B. S., K. S. A. C., 1920. H 53; 1809 Leavenworth.

GAY TETLEY KLEIN, M. S., Assistant Professor of Poultry Husbandry, Division of College Extension (1925, 1926).
B. S., University of Missouri, 1923; M. S., K. S. A. C., 1926.
Ag 245; 1711 Leavenworth.

JULIAN ADAIR HODGES, M. S., Assistant Professor of Agricultural Economics (1923, 1926).
B. S. in Agr., University of Kentucky, 1917; M. S. in Agr. Ec., ibid., 1923.
Ag 348; 500 Humboldt.

JOHN WALLACE LUMB, D. V. M., Assistant Professor of Veterinary Medicine, Division of College Extension (1924, 1926).
D. V. M., K. S. A. C., 1910. V 31; 819 Pierre.

FRANCIS EUGENE CHARLES, B. S., Assistant Professor of Industrial Journalism (1926).
B. S., K. S. A. C., 1924. K 30A; 1211 Thurston.

MARY FIDELIA TAYLOR, B. S., Assistant Professor of Physics (1919, 1926).
B. S., K. S. A. C., 1919; A. M., Teachers College, Columbia University, 1926.
C 36; Paddleford Apts.

LOUISE HELEN EVERHARDY, A. M., Assistant Professor of Applied Art (1919, 1926).
Graduate, New York School of Fine and Applied Art, 1916; B. S., Columbia University, 1925; A. M., ibid., 1926. A 56; 1301 Poyntz.

WILLIAM CHARLES JANES, A. M., Assistant Professor of Mathematics (1922, 1926).
B. S., Northwestern University, 1919; A. M., University of Nebraska, 1922.
S 55; 1022 Kearney.

THIRZA ADALINE MOSSMAN, A. M., Assistant Professor of Mathematics (1922, 1926).
A. B., University of Nebraska, 1916; A. M., University of Chicago, 1922.
A 62A; 1601 Fairchild.

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2. Absent on leave, year 1927-'28.

ETHEL MAY ARNOLD, A. M., Assistant Professor of Applied Art (1922, 1926).
B. S., K. S. A. C., 1918; Graduate, French-American School of Costume Design, Los Angeles, 1921; A. M., University of Chicago, 1925. A 68; College Hill.

BOYD BERTRAND BRAINARD, B. S., Assistant Professor of Mechanical Engineering (1923, 1926).
B. S. in M. E., University of Colorado, 1922. E 109; 1209 Vattier.

ERNEST KNIGHT CHAPIN, M. S., Assistant Professor of Physics (1923, 1926).
A. B., University of Michigan, 1918; M. S., ibid., 1923. C 57; 1860 Anderson.

JEAN SWIFT DOBBS, M. S., R. N., Assistant Professor of Household Economics (1923, 1926).
B. S., Northwestern University, 1923; R. N., Evanston Hospital, 1922; M. S., K. S. A. C., 1925. L 40; 318 N. Fifth.

RANDOLPH FORNEY GINGRICH, B. S. in C. E., Assistant Professor of Machine Design (1923, 1926).
B. S. in C. E., University of Nebraska, 1923. S 51; 1731 Humboldt.

ORVILLE DON HUNT, B. S. in E. E., Assistant Professor of Electrical Engineering (1923, 1926).
B. S. in E. E., Washington State College, 1923. E 127; 1822 Poyntz.

EDNA MARIE WILLMANN, A. M., Assistant Professor of Modern Languages (1923, 1925).
A. B., University of Kansas, 1917; A. M., ibid., 1927. A 70; 900 Leavenworth.

MARGARET AHLBORN, M. S., Assistant Professor of Food Economics and Nutrition (1923, 1926).
A. B., University of Kansas, 1906; M. S., K. S. A. C., 1924. L 47; 350 N. Fifteenth.

JOHN FREDERICK HELM, JR., B. D., Assistant Professor of Free-hand Drawing (1924, 1926).
B. D., Syracuse University, 1924. E 308; Rex Arms Apartments.

LEO SPURRIER, A. M., Assistant Professor of Economics (1924, 1926).
A. B., University of Kansas, 1923; A. M., ibid., 1924. A 74; 1026 Vattier.

HENRY MILES HEBERER, A. B., Assistant Professor of Public Speaking (1925, 1926).
A. B., University of Illinois, 1922. G 51; 1611 Laramie.

LOUIS MARK JORGENSON, B. S., Assistant Professor of Electrical Engineering (1925, 1926).
B. S., K. S. A. C., 1907. E 24; 730 Laramie.

CORNELIA WILLIAMS CRITTENDEN, A. M., Assistant Professor of Modern Languages (1926).
A. B., University of Nebraska, 1918; A. M., ibid., 1926. A 71; 1636 Fairchild.

ALICE HELEN MUSTARD, A. M., Assistant Professor of Institutional Economics (1926).
B. S., K. S. A. C., 1921; A. M., University of Chicago, 1926. Van Zile Hall.

REGINALD HENRY PAINTER, Ph. D., Assistant Professor of Entomology (1926).
A. B., University of Texas, 1922; A. M., ibid., 1924; Ph. D., Ohio State University, 1926. F 81; 1616 Fairview.

RUSSELL SEELEY SINK, M. E., Assistant Professor of Shop Practice (1926).
B. S. in M. E., Purdue University, 1918; M. E., ibid., 1925. S 62; 1605 Humboldt.

OTTO HERMAN ELMER, Ph. D., Assistant Professor of Botany and Plant Pathology (June 1, 1927).
B. S., Oregon Agricultural College, 1911; M. S., ibid., 1916; Ph. D., Iowa State College, 1924. H 56; 1612 Osage.

ROLLA WILLIAMS TITUS, Ph. D., Assistant Professor of Chemistry (1923; July 1, 1927).

A. B., Washburn College, 1909; A. M., University of Kansas, 1914; Ph. D., University of Wisconsin, 1927. C 14; 1230 Pierre.

ALBERT JOHN SCHOTH, B. S., Assistant Professor in Junior Extension, Division of College Extension (1921; July 1, 1927).

B. S., Oregon Agricultural College, 1918. A 35; 1116 Bluemont.

WILLIAM REDMOND MARTIN, JR., B. S., Assistant Professor of Horticulture, Division of College Extension (1924; July 1, 1927).

B. S., K. S. A. C., 1917. A 34; 1116 Bluemont.

GEORGIANA SMURTHWAITE, B. S., Assistant Professor of Food and Nutrition, Division of College Extension (1924; July 1, 1927).

B. S., Utah Agricultural College. A 36; 1715 Anderson.

JEPTHA JERRY MOXLEY, B. S., Assistant Professor of Animal Husbandry, Division of College Extension (1925; July 1, 1927).

B. S. in Agr., K. S. A. C., 1922. A 34; 1116 Bluemont.

HELEN PANSY HOSTETTER, M. S., Assistant Professor of Industrial Journalism and Printing (1926; July 1, 1927).

A. B., University of Nebraska, 1917; M. S., Northwestern University, 1926. K 30A; 1601 Fairchild.

LEAH ASCHAM, B. S., Assistant Professor of Food Economics and Nutrition (Feb. 1, 1927; Sept. 1, 1927).

A. B., Ohio Northern University, 1904; B. S., Ohio State University, 1918. L 69; 906 Fremont.

STELLA MAUDE HARRISS, M. S., Assistant Professor of Chemistry (1917; Sept. 1, 1927).

Graduate, (Peru) Nebraska State Normal School, 1908; B. S., K. S. A. C., 1917; M. S., ibid., 1919. W 26; 311 Denison.

ANNABEL ALEXANDER GARVEY, A. M., Assistant Professor of English (1920; Sept. 1, 1927).

A. B., Wellesley College, 1912; A. M., University of Kansas, 1914. A 55A; 343 N. Fourteenth.

HELEN DOROTHY RUSHFELDT, A. M., Assistant Professor of English (1920; Sept. 1, 1927).

A. B., University of Minnesota, 1915; A. M., Columbia University, 1920. A 63A; 513 N. Sixteenth.

ESTHER BRUNER, M. S., Assistant Professor of Clothing and Textiles (1920; Sept. 1, 1927).

B. S., K. S. A. C., 1920; M. S., ibid., 1921. L 53; 311 Denison.

NAOMI BERTHA ZIMMERMAN, M. S., Assistant Professor of Zoölogy (1922; Sept. 1, 1927).

B. S., University of Nebraska, 1919; M. S., ibid., 1922. F 40; 912 N. Tenth.

INEZ GERTRUDE ALSOP, M. S., Assistant Professor of History and Government (1923; Sept. 1, 1927).

B. S., K. S. T. C., Emporia, 1916; M. S., University of Kansas, 1926. F 63; 1601 Fairchild.

JAMES PHILLIP CALLAHAN, A. M., Assistant Professor of English (1924; Sept. 1, 1927).

B. S., K. S. T. C., Hays, 1919; A. M., University of Kansas, 1926. K 54; 715 Houston.

HARRIET SHIPLEY PARKER, A. M., Assistant Professor of English (1924; Sept. 1, 1927).

A. B., University of Kansas, 1909; A. M., Washington University, 1912. A 53; 412 N. Sixteenth.

OSCEOLA HALL BURR, M. S., Assistant Professor of Public Speaking (1923; Sept. 1, 1927).
B. S., K. S. A. C., 1923; M. S., ibid., 1925. G 55; Tatarrax Apartments.

HAROLD HOWE, M. S., Assistant Professor of Agricultural Economics (1925; Sept. 1, 1927).
B. S., K. S. A. C., 1922; M. S., University of Maryland, 1923. Ag 345; 1204 Fremont.

ALICE CLAYPOOL JEFFERSON, Assistant Professor of Piano (1925; Sept. 1, 1927).
Graduate, American Conservatory of Music, 1921. MA 8; 906 Fremont.

MYRTLE ANNICE GUNSELMAN, A. M., Assistant Professor of Household Economics (1926; Sept. 1, 1927).
B. S., K. S. A. C., 1919; A. M., University of Chicago, 1926. T 52; 1016 Vattier.

CLARENCE OWEN GRANFIELD, B. S., Assistant Professor of Coöperative Experiments, Department of Agronomy (1920; Sept. 1, 1927).
B. S., K. S. A. C., 1917. Ag 202; 1810 Leavenworth.

CARL ALFRED BRANDLY, D. V. M., Assistant Professor of Bacteriology (Sept. 1, 1927).
D. V. M., K. S. A. C., 1923. V 53; 1026 Kearney.

MILDRED CAMP, B. L. S., Head of Circulation Department, College Library (Sept. 1, 1927).
A. B., Eureka College, 1912; B. L. S., University of Illinois, 1924.
Li; 1743 Fairchild.

FRED LOUIS PARRISH, A. M., Assistant Professor of History and Government (Sept. 1, 1927).
A. B., Northwestern University, 1917; B. D., Garrett Biblical Institute, 1920; A. M., Northwestern University, 1922. F 64; 816 Vattier.

LEON REED QUINLAN, M. L. A., Assistant Professor of Horticulture, in Charge of Landscape Gardening (Sept. 1, 1927).
B. S., Colorado Agricultural College, 1920; M. L. A., Harvard University, 1925.
H 34; 1317 Laramie.

MAURICE ROSE, Capt. Inf., U. S. A., Assistant Professor of Military Science and Tactics (Sept. 1, 1927).
Graduate, U. S. Infantry School, 1926. N 26; 1524 Humboldt.

CHARLES HARRINGTON STEWART, Capt., C. A. C., U. S. A., Assistant Professor of Military Science and Tactics (Sept. 1, 1927).
Graduate, Coast Artillery School, 1923. N 26; 1819 Leavenworth.

CORA PEARL SNYDER, M. D., Assistant College Physician (Sept. 12, 1927).
B. S., University of Kansas, 1924; M. D., Medical School, ibid., 1926.
A 59; 1719 Laramie.

ELDEN EMANUEL LEASURE, D. V. M., Assistant Professor of Pathology (1926; Jan. 1, 1928).
D. V. M., K. S. A. C., 1923. V 55; 1531 Leavenworth.

EDWARD RAYMOND FRANK, D. V. M., Assistant Professor of Surgery and Medicine (1926; Jan. 1, 1928).
B. S. in Ag., K. S. A. C., 1918; D. V. M., ibid., 1924. VH 53; 1114 Fremont.

ASSOCIATES

ARTHUR MAXWELL BRUNSON,[1] Ph. D., Associate in Plant Breeding, Agricultural Experiment Station (1923).
B. S., University of Illinois, 1913; M. S., ibid., 1919; Ph. D., Cornell University, 1923.
Ag 302; 1730 Fairview.

FRANK HAROLD COLLINS, M. S., Associate in Food Analysis (1925, 1926).
B. S., K. S. A. C., 1920; M. S., University of Idaho, 1925. W 29; 1031 Humboldt.

1. In coöperation with the U. S. Department of Agriculture.

INSTRUCTORS

BENJAMIN LEVI SMITZ,[9] Ph. D., Instructor in General Chemistry (1926; Sept. 1, 1927).
B. S., Michigan State College, 1924; M. S., ibid., 1925; Ph. D., ibid., 1926.
C 10; 1719 Fairchild.

EDWARD GRANT, Instructor in Molding (1913); Foreman of Foundry (1913).
S 42; 1733 Laramie.

INA EMMA HOLROYD, B. S., Instructor in Mathematics (1900, 1914).
B. S., K. S. A. C., 1897; B. S., Kansas State Teachers College, Emporia, 1916.
A 62A; 1001 Moro.

KATHERINE MAXWELL BOWER, A. M., Instructor in English (1918, 1919).
B. S., K. S. A. C., 1915; A. M., University of Kansas, 1924. A 54; 817 Poyntz.

W. PEARL MARTIN, R. N., Instructor in Home Health and Sanitation, Division of College Extension (1919).
Graduate, Christ's Hospital, Topeka. A 36; 930 Osage.

S. FRED PRINCE, Biological Artist (1918, 1919).
Ag 363; 1030 Kearney.

MARION COFFEE, First Sergt., U. S. A., Instructor in Military Science and Tactics (1920).
N 26; R. R. 8.

NELLIE ABERLE, M. S., Instructor in English (1921).
B. S., K. S. A. C., 1912; M. S., ibid., 1914. A 63A; 1442 Fairchild.

CLARA BOGUE, A. M., Instructor in English (1921).
B. S. in Ed., Kansas State Teachers College, Emporia, 1919; A. M., University of Chicago, 1921. A 61; 1445 Laramie.

CECIL AQUILA GUNNS, Instructor in Zoölogy (1921).
F 31; 926 Vattier.

ELLEN MARGARET BATCHELOR, B. S., Instructor and Assistant State Home Demonstration Leader, Division of College Extension (1917, 1921).
B. S., K. S. A. C., 1911. A 36; 1119 Kearney.

ROY WILSON WAMPLER,[2] M. S., Instructor in Chemistry (1921, 1922).
A. B., McPherson College, 1920; M. S., K. S. A. C., 1921. C 10; 819 Kearney.

JESSIE GULICK, Acting Head Cataloguer in Library (1907, 1923).
Li 52; 421 N. Sixteenth.

WILLIAM WESLEY CRAWFORD, M. Di., Instructor in Civil Engineering (1923).
A. B., University of Iowa, 1912; B. S. in C. E., Iowa State College, 1917; M. Di., Iowa State Teachers College, 1908. E 220; 715 Poyntz.

CONIE CAROLINE FOOTE, B. S., Instructor and Specialist in Foods and Nutrition, Division of College Extension (1924).
B. S., K. S. A. C., 1921. A 36; 513 N. Sixteenth.

HENRY EVERT WICHERS, M. S., Instructor in Rural Architecture (1924).
B. S. in Arch., K. S. A. C., 1924; M. S. in Arch., ibid., 1925.
E 224; 1501 Humboldt.

MAUD ELIZABETH DEELEY, B. S., Instructor in Clothing and Textiles, Division of College Extension (1923, 1925).
B. S., K. S. A. C., 1923. A 36; 1531 Leavenworth.

FRANCIS DALE PUGH, Sergt. Inf., U. S. A., Instructor in Military Science and Tactics (1925).
N 29; 1010 Vattier.

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2. Absent on leave, year 1927-'28.
9. Temporary appointment.

HARRY RAY BRYSON, M.S., Instructor in Entomology (1924, 1925).
B. S., K. S. A. C., 1917; M. S., ibid., 1924. F 55; 1821 Leavenworth.

HAZEL THOMPSON, Supervisor of Vocational Home Making, Department of Education (1925).

OPHA MAUST, M.S., Instructor in Psychology (1925).
B. S., K. S. A. C., 1922; M. S., ibid., 1923. G 33; 821 Humboldt.

VERNON EVERETT BUNDY,[6] B.S., Instructor in English (1925-Oct. 31, 1927).
B. S., K. S. A. C., 1920.

MAURINE SMITH CONOVER,[2] Instructor in Voice (1925).
Graduate in Music, Kansas State Teachers College, Emporia, 1927.
MA 13; 513 N. Sixteenth.

HUBERT WHATLEY MARLOW, B.S., Instructor in Chemistry (1925).
B. S., North Texas Teachers College, 1925. W 31; 113 N. Ninth.

RICHARD LAWRENCE PYCHA, B.S., Instructor in Chemistry (1925).
B. S., K. S. A. C., 1925. W 31; 1000 Ratone.

MARJORIE KATHERINE SCHOBEL, Instructor in Voice (1925).
Graduate, Monticello Seminary, 1916. MA 13; 1723 Leavenworth.

IRMA SMITH, B.Mus., Instructor in Piano (1925).
B. Mus., Illinois Wesleyan College of Music, 1925. MA 5; 1718 Fairview.

HARRY STEPHEN BUECHE, E.E., Instructor in Electrical Engineering (1925).
B. S. in E. E., Villanova College, 1922; E. E., ibid., 1924. E 19; 1116 Bluemont.

GEORGE MONTGOMERY, M.S., Instructor in Animal Husbandry, Home-Study Service, Division of College Extension (1925).
B. S., K. S. A. C., 1925; M. S., ibid., 1927. A 5; 912 Laramie.

EDWARD AMIN ABDUN-NUR,[8] B.S., Instructor in Applied Mechanics (1926).
A. B., American University of Beirut, 1922; B. S., Massachusetts Institute of Technology, 1924.

ARTHUR CLINTON ANDREWS, B.S., Instructor in Chemistry (1926).
B. S., University of Wisconsin, 1924. D 30; 1116 Bluemont.

LINUS BURR SMITH,[2] B.S., Instructor in Architecture (1926).
B. S., K. S. A. C., 1926. E 308; 1811 Humboldt.

EDNA MINERVA BENDER, B.S., Assistant State Club Leader, Division of College Extension (1926).
B. S., University of Minnesota, 1923. A 35; 1649 Fairchild.

ROY BAINER, B.S., Instructor in Agricultural Engineering (1926).
B. S., K. S. A. C., 1926. E 215; 321 Denison.

HERBERT STASSEN HINRICHS, B.S., Field Engineer (1925, 1926).
B. S., University of Illinois, 1918. Larned, Kan.

MAY MILES, B.S., Instructor in Household Management, Division of College Extension (1926).
B. S., University of Illinois, 1926. A 36; 1649 Fairchild.

FRED WILSON DOELZ, Instructor in Shop Practice (1926).
Graduate, Dunwoody Institute, 1922. S 32; Shafer Apts.

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2. Absent on leave, year 1927-'28.
6. Resigned.
8. Absent on indefinite leave.

RUTH EMMA TUCKER, M.S., Instructor in Food Economics and Nutrition (1925, 1926).
A. B., University of Illinois, 1923; M. S., ibid., 1925. L 69; 1109 Kearney.

ELIZABETH QUINLAN, M.S., Instructor in Clothing and Textiles (1925, 1926).
B. S., K. S. A. C., 1917; M. S., Columbia University, 1924. L 53; 1212 Fremont.

KATHERINE JANE HESS, M.S., Instructor in Clothing and Textiles (1925, 1926).
B. S., K. S. A. C., 1900; M. S., ibid., 1926. L 53; 601 Fremont.

ROY CLINTON LANGFORD, M.S., Instructor in Psychology (1925, 1926).
B. S., K. S. A. C., 1925; M. S., ibid., 1926. G 34; 411 N. Sixteenth.

HAROLD JEROME BROOKS, M.S., Instructor in Dairy Husbandry (1926).
B. S., University of Missouri, 1924; M. S., South Dakota State College, 1926.
Ag 145; 1116 Bluemont.

IRENE ELDRIDGE, A.M., Instructor in Mathematics (1926).
B. S., Beloit College, 1920; A. M., ibid., 1924. A 62A; 1715 Anderson.

ARTHUR EDWIN GUEST, A.B., Instructor in General Chemistry (1926).
A. B., Simpson College, 1923. C 56; 1116 Bluemont.

MAURINE IRWIN,[6] A.B., Loan Assistant in Library (1926-Mar. 31, 1928).
A. B., Knox College, 1925. Li; 426 N. Sixteenth.

CARROLL MENDENHALL LEONARD, B.S. in M.E., Instructor in Mechanical Engineering (1926).
B. S. in M. E., K. S. A. C., 1924. E 109; R. R. 1.

MAYNARD LEE MCDOWELL, A.M., Instructor in Chemistry (1926).
A. B., Central College, 1924; A. M., University of Missouri, 1926.
W 30; 520 Thurston.

KEITH PARSONS NOWELL, B.S., Instructor in Electrical Engineering (1926).
B. S., K. S. A. C., 1925. E 24; 1010 Laramie.

HERBERT LAFERN OAKES, B.S., Instructor in Civil Engineering (1926).
B. S. in C. E., University of Oklahoma, 1926. E 220; 414 N. Juliette.

LAWRENCE FREDERICK PETERSON, B.S., Instructor in Physics (1926).
B. S., University of Chicago, 1926. C 57; 1212 Fremont.

THOMAS ISAAC PORTER, A.B., Instructor in Mathematics (1926).
A. B., University of Missouri, 1915; B. S. in Ed., ibid., 1915.
F 1; 615 Humboldt.

MORDICA MCKINNEY RYAN, M.S., Instructor in General Chemistry (1926).
A. B., Bethany (W. Va.) College, 1923; M. S., Ohio State University, 1926.
D 30; 1433 Anderson.

MAYBELLE PRITCHARD SMITH, M.S., Instructor in General Chemistry (1926).
A. B., University of Illinois, 1922; M. S., University of Wisconsin, 1926.
W 26; 426 N. Seventeenth.

HARRY MARTIN STEWART, M.B.A., Instructor in Mathematics (1926).
A. B., University of Kansas, 1920; M. B. A., ibid., 1926. S 55; 915 Fremont.

HOWARD DALE TYNER, B.S., Instructor in General Chemistry (1926).
B. S., Illinois Wesleyan University, 1925. D 30; 1116 Bluemont.

MARION WHITTAKER, M.S., Instructor in General Chemistry (1926).
A. B., Mount Holyoke College, 1923; M. S., University of Michigan, 1926.
W 26; 426 N. Seventeenth.

ALDEN HEBBARD LOOMIS, B.S., Instructor in Woodworking (1926).
B. S., Oklahoma A. and M. College, 1916. S 28; 1017 Kearney.

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6. Resigned.

JOHN CARL OLSEN, B.S., in M.E., Instructor in Machine Design (1927).
B. S. in M. E., Colorado Agricultural College, 1925. E 209; 1820 El Paso.

MATTHEW JOSEPH CONNOLLY, Sergt. Inf., U. S. A., Instructor in Military Science and Tactics (1927).
N 26; 517 Leavenworth.

EDWARD DOUGALL GORDON,[9] M.S., Instructor in Agricultural Engineering (Feb. 1, 1927-Feb. 28, 1928).
B. S. in A. E., Iowa State College, 1923; M. S. in A. E., ibid., 1924. E 217; 1000 Moro.

MARTIN ADKISSON ALEXANDER, M.S., Instructor in Animal Husbandry (July 1, 1927).
B. S., Washington State College, 1923; M. S., Colorado Agricultural College, 1924.
Ag 19; 1641 Laramie.

ROYCE OWEN PENCE, B.S. in F.M.E., Instructor in Milling Industry (July 1, 1927).
B. S. in F. M. E., K. S. A. C., 1924. Ag 120; 1018 Fremont.

LILLIAN JULIETTE SWENSON, A.B., Reference Assistant in Library (Aug. 1, 1927).
A. B., Colorado College, 1924; B. S., Simmons College, 1927. Li 51; 804 Fremont.

MARIA MORRIS, M.S., Instructor in Applied Art (1925; Sept. 1, 1927).
B. S., K. S. A. C., 1911; Graduate, New York School of Fine and Applied Art, 1924; M. S., K. S. A. C., 1927. A 67; 816 N. Juliette.

ELSA OTTILIA HORN, M.S., Instructor in Botany and Plant Pathology (1926; Sept. 1, 1927).
A. B., University of Minnesota, 1919; M. S., Oregon Agricultural College, 1926.
H 76B; 1613 Fairchild.

LAURA BELLE BAXTER,[9] B.S., Instructor in Education (Sept. 1, 1927).
B. S., K. S. A. C., 1915. M. H. S.; 610 Vattier.

GEORGE FRANCIS BRANIGAN, B.S., Instructor in Machine Design (Sept. 1, 1927).
B. S., University of Nebraska, 1927. S 63; 1116 Bluemont.

IDA VIRGINIA CARTER, B.L.S., Loan Assistant in Library (1927; Apr. 1, 1928); General Assistant in Library (Sept. 1, 1927-Mar. 30, 1928).
A. B., West Virginia University, 1924; B. L. S., University of Illinois, 1927.
Li 52; 326 N. Sixteenth.

WILBUR JOHN CAULFIELD, M.S., Instructor in Dairy Husbandry (Sept. 1, 1927).
B. S., University of Minnesota, 1924; M. S., Pennsylvania State College, 1926.
Ag 147; 1116 Bluemont.

THEODORE AVERY CHADWICK,[9] B.S., Instructor in Architecture (Sept. 1, 1927).
B. S., North Dakota State College, 1927. E 306; 1116 Bluemont.

DURA LOUISE COCKRELL, A.M., Instructor in Household Economics (Sept. 1, 1927).
A. B., Texas Christian University, 1923; A. M., Columbia University, 1924.
L 35; 1704 Fairview.

GEORGE FRANCIS CORCORAN, M.S., Instructor in Electrical Engineering (Sept. 1, 1927).
B. S., South Dakota State College, 1923; M. S., University of Minnesota, 1926.
E 127; 1116 Bluemont.

HORATIO MINTER FARRAR, A.B., Instructor in Voice (Sept. 1, 1927).
A. B., Hastings College, 1927; Voice Diploma, ibid., 1927. MA 12; 1116 Bluemont.

9. Temporary appointment.

KATHERINE GEYER,[9] B. S., Instructor in Physical Education for Women (Sept. 1, 1927).
Diploma, Sargent School for Physical Education, 1925; B. S. in Ed., Ohio State University, 1927. N 1; 315 N. Sixteenth.

HOWARD KAY GLOYD, B. S., Instructor in Zoölogy (Sept. 1, 1927).
B. S., Ottawa University, 1924. F 76A; 1001 Laramie.

HILDA ROSE GROSSMAN,[9] B. M., Instructor in Voice (Sept. 1, 1927).
B. M., Chicago Musical College, 1925; Illinois State Certificate in Public School Music, ibid., 1927. MA 14; 1605 Leavenworth.

VIDA AGNES HARRIS, A. M., Instructor in Applied Art (Sept. 1, 1927).
B. S., K. S. A. C., 1914; A. M. University of Chicago, 1927. A 56; West Anderson.

HOMER JAY HENNEY, B. S., Instructor in Agricultural Economics (Sept. 1, 1927).
B. S., K. S. A. C., 1921. Ag 353; 1531 Leavenworth.

MARY CLARA JACKSON, B. M., Instructor in Violin (Sept. 1, 1927).
B. M., K. S. A. C., 1927. MA 7; 801 Moro.

LORETTA MCELMURRY, B. S., Instructor in Clothing and Textiles, Division of College Extension (Sept. 1, 1927).
B. S., South Dakota State College, 1901. A 36; 1728 Fairview.

LAWSON FRANCIS MARCY, A. M., Instructor in General Chemistry (Sept. 1, 1927).
A. B., Evansville College, 1924; A. M., Columbia University, 1926. D 26; 1116 Bluemont.

GEORGE WILLARD MAXWELL, A. M., Instructor in Physics (Sept. 1, 1927).
A. M., University of Michigan, 1920. C 38; 810 Vattier.

DOROTHY BRADFORD PETTIS, A. M., Instructor in Modern Languages (Sept. 1, 1927).
A. B., University of Nebraska, 1919; A. M., ibid., 1924. A 70; 1605 Leavenworth.

HENRY ROSS, B. S., Instructor in Mathematics (Sept. 1, 1927).
B. S., Syracuse University, 1926. S 56; 615 Humboldt.

DOROTHY MARGARET SAPPINGTON, B. S., Instructor in Physical Education for Women (Sept. 1, 1927).
B. S., University of Missouri, 1926. N 1; 1641 Fairchild.

WILLIAM BOWEN SARLES, M. S., Instructor in Bacteriology (Sept. 1, 1927).
B. S., University of Wisconsin, 1926; M. S., ibid., 1927. V 52; 1127 Kearney.

EARL LE ROY SITZ, B. S., Instructor in Machine Design (Sept. 1, 1927).
B. S. in E. E., Iowa State College, 1927. E 209; 1116 Bluemont.

CHARLES WILLIAM STRATTON, B. M., Instructor in Piano (Sept. 1, 1927).
B. M., K. S. A. C., 1926. MA 4; 511 N. Sunset.

GLADYS ELLEN VAIL, M. S., Instructor in Food Economics and Nutrition (Sept. 1, 1927).
A. B., Southwestern College, 1924; M. S., University of Chicago, 1927. L 69; 522 N. Fourteenth.

FLORENCE PATRICIA STEEL, M. M., Instructor in Piano (Sept. 19, 1927).
B. M., Bush Conservatory, 1925; M. M., ibid., 1927. M 52; 1115 Thurston.

IVA MCCONAGHA,[9] A. M., General Assistant in Library (April 1, 1928).
A. B., Muskingum College, 1917; A. M., Columbia University, 1925. Li 52; ———

9. Temporary appointment.

ASSISTANTS

ALANSON LOLA HALLSTED, B. S., Assistant in Dry Farming, Fort Hays Branch Agricultural Experiment Station (1910).
B. S., K. S. A. C., 1903. Hays, Kan.

NELLIE MAY, Postmistress (1911).
A 44; R. R. 2.

HATTIE HELEN WHITE, Secretary, Business Office (1912).
A 27; 717 Laramie.

ROBERT GETTY,[1] B. S. A., Assistant in Forage Crops, Fort Hays Branch Agricultural Experiment Station (1913).
B. S. A., University of Nebraska, 1913. Hays, Kan.

MABEL GERTRUDE BAXTER, Assistant in Charge of Continuations, College Library (1916, 1918).
Li 26; 1624 Fairchild.

ELISABETH PERRY HARLING, Seed Analyst, Department of Agronomy (1912, 1917).
Ag 77; 628 Fremont.

GEORGE HERBERT PHINNEY, Assistant in Agronomy (1917); Foreman of Agronomy Farm (1917).
Graduate, Topeka Business College, 1903. Agronomy Farm.

MARY KIMBALL, B. S., Assistant to the Registrar (1918).
B. S., K. S. A. C., 1907. A 29; 1311 Laramie.

MYRTLE EVELYN ZENER, Secretary to the Vice President (1918).
A 47; 1423 Fairchild.

CHESTER WILLIS OAKES, Miller, Department of Milling Industry (1918).
Ag 198A; 1326 Houston.

LOUISE SCHWENSEN, Secretary to the Dean, Division of Engineering (1915, 1918).
E 115; 1800 Fairchild.

BRUCE BUNYAN SMITH, Assistant in Agricultural Engineering (1918).
Bks. 2; 830 Laramie.

ALICE MAUDE MELTON, B. S., Assistant to the Dean, Division of General Science (1900, 1919).
B. S., K. S. A. C., 1898. A 50; 831 Leavenworth.

JOHN VICTOR ROLANDER, Assistant in Heat and Power (1919).
E 27; 517 Kearney.

EDWARD L. CLAEREN, Major, U. S. R., Military Property Custodian, Department of Military Science and Tactics (1910, 1919).
N 29; 900 Pierre.

GRACE ELLEN UMBERGER, B. S., R. N., Head Nurse, Department of Student Health (1919).
B. S., K. S. A. C., 1905; R. N., Illinois Training School for Nurses, 1909.
A 65; 1412 Leavenworth.

ARTHUR FRITHIOF SWANSON, B. S., Assistant in Cereal Investigations, Fort Hays Branch Agricultural Experiment Station (1919).
B. S., K. S. A. C., 1919. Hays, Kan.

DELFA MARY HAZELTINE, Assistant to the Dean, Division of College Extension (1920).
Graduate, Lawrence Business College. A 33; 817 Poyntz.

1. In coöperation with the U. S. Department of Agriculture.

CHARLES OTIS JOHNSTON,[1] M.S., Assistant Plant Pathologist, Agricultural Experiment Station (1920).
B. S., K. S. A. C., 1918; M. S., ibid., 1924. H 53; 1323 Laramie.

CLARENCE OSBORN PRICE, Assistant to the President (1920).
A 32; 501 Bluemont.

JOSEPH FARRINGTON MERRILL, B.S., Assistant Chemist, Agricultural Experiment Station (1921).
B. S., University of Maine, 1907. C 3; 318 N. Sixteenth.

FLOYD JOSEPH HANNA, Assistant in Department of Illustrations (1922).
I; 1612 Leavenworth.

EMBERT HARVEY COLES,[1] B.S., Assistant in Dry-land Agricultural Investigations, Garden City Branch Agricultural Experiment Station (1922).
B. S., K. S. A. C., 1922. Garden City, Kan.

KATHERINE FAULCONER, Secretary to the Dean, Division of Home Economics (1922, 1926).
L 29; 1019 Bluemont.

CLARA MAGDALENE SIEM, Financial Secretary, Division of College Extension (1920, 1924).
A 33; 1425 Humboldt.

ANDREW EDWARD OMAN,[10] M.F., Specialist in Rodent Control, Division of College Extension (1923).
B. S., K. S. A. C., 1900; M. F., Yale University, 1906. A 34; 1207 Houston.

FLORENCE LILLIAN DIAL, B.S., Class Reserves Assistant in Library (1923).
B. S., K. S. A. C., 1919. Li 1; 1030 Moro.

FRED FOSTER GREELEY, Assistant in Shop Practice (1903).
S 30; 931 Fremont.

WILLIAM HENRY IRWIN, Assistant in Shop Practice (1923).
S 29; R. R. 2.

REBECCA SALOME MEYER, R.N., Nurse in College Hospital (1923).
Graduate, Mary Thompson Hospital, Chicago, 1900. College Hospital.

ROY MOORE,[10] Specialist in Rodent Control Work, Division of College Extension (1923).
A 34A; 111 N. Fifteenth.

CARRIE ISABEL POTTER, M.S., Assistant in Genetics, Department of Zoölogy (1924).
B. S., Ottawa University, 1922; M. S., University of Iowa, 1924.
Insectary; 426 N. Sixteenth.

WALTER R. WEAVER, Assistant to Superintendent, Fort Hays Branch Agricultural Experiment Station (1925).
Hays, Kan.

GERALD LESLIE TAYLOR, Radio Operator, Division of College Extension (1925).
N 83; 1649 Fairchild.

JOHN G. WILLIER,[1] Assistant Agronomist, Agricultural Experiment Station (1925).
Ag 302; 1738 Fairchild.

HAZEL ELIZABETH TAYLOR, Secretary, Department of Education (1925).
G 28; 1449 Laramie.

LUCILE BRICKNER, B.S., Assistant to Dean of Women (1925).
A 61A; 1449 Laramie.

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1. In coöperation with the U. S. Department of Agriculture.
10. In coöperation with Biological Survey, U. S. D. A.

JEANNE MACBRIDE, Housekeeper in College Hospital, Department of Student Health (1925).
College Hospital.

BESS LUCILE HYDE, Secretary to the President (1926).
A 30; 320 N. Fifteenth.

JOSEPH BENJAMIN KUSKA, B. S., Scientific Assistant, Colby Branch Agricultural Experiment Station (1926).
Colby, Kan.

RUTH MARY TRANT, A. B., Assistant in Physical Education for Women (1925, 1926).
A. B., University of Kansas, 1920. N 1; 1119 Kearney.

ACHSA JOHNSON, B. S., Assistant in Cafeteria (1926).
B. S., K. S. A. C., 1926. T 30; 1613 Fairchild.

FRANK LEWIS MYERS, B. M., Assistant to the Director of Physical Education (1926).
B. M., K. S. A. C., 1924. N 35; 821 Vattier.

RENNA REGINA ROSENTHAL,[9] B. S., Assistant in English (1926).
B. S., K. S. A. C., 1923. A 54; 1613 Fairchild.

CLARA LISSETTE OTT, Assistant to the Registrar (1926).
A 29; 904 Bluemont.

JACK HARRIS LINSCOTT, Assistant in Heat and Power (1927).
E 27; 1030 Houston.

ERNEST WILLIAM JOHNSON, B. S., Forest Nurseryman, Fort Hays Branch Agricultural Experiment Station (1927).
B. S., Colorado Agricultural College, 1926. Hays, Kan.

RAYMOND HOWARD DAVIS, B. S., Assistant in Soil Survey (June 1, 1927).
B. S. in Agr., K. S. A. C., 1927. Ag 202; 1031 Moro.

LISLE LESLIE LONGSDORF, M. S., Extension Editor, Division of College Extension (July 1, 1927).
B. S., University of Wisconsin, 1925; M. S., ibid., 1926. A 34; 1116 Bluemont.

CHRISTOPHER HENRY FICKE,[9] M. S., Assistant Pathologist, Department of Botany and Plant Pathology (1925; Sept. 1, 1927).
B. S., Iowa State College, 1925; M. S., K. S. A. C., 1927. H 53; 930 Ratone.

MARGARET ALICE NEWCOMB, M. S., Assistant in Botany and Plant Pathology (1925; Sept. 1, 1927).
B. S., K. S. A. C., 1925; M. S., ibid., 1927. H 57; 930 Fremont.

LAWRENCE FENER HALL,[9] B. S., Assistant in Education (1926; Sept. 1, 1927).
B. S., K. S. A. C., 1923. G 29; 1221 Laramie.

LEOLA IRENE GRANT, R. N., Nurse, Department of Student Health (Sept. 1, 1927).
Graduate Nurse, John Sealy Hospital, 1924. College Hospital.

KATHARYN PHOEBE ZIPSE, B. S., Critic Teacher, Home Economics Education (Sept. 1, 1927).
B. S., K. S. A. C., 1913. L 66; 1821 Poyntz.

BLANCHE KIMBALL, R. N., Nurse, Department of Student Health (Sept. 26, 1927).
R. N., Bethany Hospital, Kansas City, Kan., 1920. College Hospital.

9. Temporary appointment.

EMERY JACK COULSON, B.S., Assistant Chemist, Agricultural Experiment Station (Oct. 3, 1927).
B. S., K. S. A. C., 1927. C 4; 1201 Moro.

KARL THORSTEN RISTY, B.S., Assistant in Genetics, Department of Animal Husbandry (1927; April 1, 1928); Graduate Assistant in Genetics (Sept. 1, 1927-Mar. 31, 1928).
B. S., South Dakota State College, 1926. Ag 96; 924 Moro.

SUPERINTENDENTS

LOUIS C. AICHER, B.S., Superintendent, Fort Hays Branch Agricultural Experiment Station (1921).
B. S. in Agr., K. S. A. C., 1910. Hays, Kan.

JACOB LUND, M.S., Superintendent of Heat and Power, Emeritus (1883, 1925); Custodian of Buildings and Grounds, Emeritus (1893, 1925).
B. S., K. S. A. C., 1883; M. S., ibid., 1886. E 26B; 1414 Fairchild.

CHARLES WESLEY HOBBS, D.V.S., Superintendent of Vaccine Laboratories (1913, 1919).
D. V. S., Western Veterinary College, 1901. V 31; 1328 Fremont.

GEORGE RICHARD PAULING, Superintendent of Maintenance, in Charge of Building and Repairs, Custodian, and Heat and Power Departments (1916, 1925).
X 26; 210 S. Seventeenth.

FAY ARTHUR WAGNER, B.S., Superintendent, Garden City Branch Agricultural Experiment Station (1919).
B. S. in Agr., New Mexico Agricultural College, 1916. Garden City, Kan.

BENJAMIN FRANCIS BARNES, B.S., Superintendent, Colby Branch Agricultural Experiment Station (1921).
Colby, Kan.

THOMAS BRUCE STINSON, B.S., Superintendent, Tribune Branch Agricultural Experiment Station (1924).
B. S., K. S. A. C., 1924. Tribune, Kan.

ALLEN PEARSON LOOMIS, Superintendent of Poultry Farm (1926).
Poultry Farm, Route 8.

HARRY ALCID SWIM, B.S., Assistant Superintendent of Building and Repair (1926).
B. S. in E. E., K. S. A. C., 1925. Bks. No. 1; 1613 Humboldt.

AGRICULTURAL AGENTS[1]

FLOYD JOE ROBBINS, B.S., Franklin County Agricultural Agent, Division of College Extension (1917).
B. S., K. S. A. C., 1913. Ottawa, Kan.

HERBERT LYNNE HILDWEIN, B.S., Sedgwick County Agricultural Agent, Division of College Extension (1917, 1926).
B. S., K. S. A. C., 1914. Wichita, Kan.

JOE MYRON GOODWIN, Atchison County Agricultural Agent, Division of College Extension (1919, 1923).
Effingham, Kan.

CHARLES ELMER CASSEL, B.S., Butler County Agricultural Agent, Division of College Extension (1912, 1923).
B. S., K. S. A. C., 1910. Lyndon, Kan.

1. In coöperation with the U. S. Department of Agriculture.

ALBERT BARNEY KIMBALL, B.S., Smith County Agricultural Agent, Division of College Extension (1918, 1925).
B. S., K. S. A. C., 1889. Smith Center, Kan.

ROBERT ELLIOTT CURTIS, B.S., Ottawa County Agricultural Agent, Division of College Extension (1919, 1924).
B. S., K. S. A. C., 1916. Minneapolis, Kan.

HERMAN FREDERICK TAGGE, B.S., Jackson County Agricultural Agent, Division of College Extension (1920, 1923).
B. S., K. S. A. C., 1914. Holton, Kan.

JOHN ALBERT HENDRIKS, B.S.A., Anderson County Agricultural Agent, Division of College Extension (1920, 1924).
B. S. A., Iowa State College, 1913. Garnett, Kan.

ERNEST LEE MCINTOSH, B.S., Osage County Agricultural Agent, Division of College Extension (1920, 1923).
B. S., K. S. A. C., 1920. Lyndon, Kan.

HARRY CHARLES BAIRD, B.S., Ford County Agricultural Agent, Division of College Extension (1920).
B. S., K. S. A. C., 1914. Dodge City, Kan.

ARTHUR I. GILKISON, Douglas County Agricultural Agent, Division of College Extension (1920, 1926).
Lawrence, Kan.

CARL LEWIS HOWARD, B.S., Lyon County Agricultural Agent, Division of College Extension (1920, 1926).
B. S., K. S. A. C., 1920. Emporia, Kan.

ROY ELMER GWIN, B.S., Allen County Agricultural Agent, Division of College Extension (1921, 1924).
B. S., K. S. A. C., 1914. Iola, Kan.

JOHN VERN HEPLER, B.S., Washington County Agricultural Agent, Division of College Extension (1921).
B. S., K. S. A. C., 1916. Washington, Kan.

PAUL BERNARD GWIN, B.S., Geary County Agricultural Agent, Division of College Extension (1921, 1925).
B. S., K. S. A. C., 1916. Junction City, Kan.

WILLIAM LOUIS TAYLOE, B.S.A., Crawford County Agricultural Agent, Division of College Extension (1921).
B. S. A., University of Missouri, 1917. Girard, Kan.

CHARLES HAROLD STINSON, B.S., Pratt County Agricultural Agent, Division of College Extension (1921, 1923).
B. S., K. S. A. C., 1921. Pratt, Kan.

CLARENCE ROY JACCARD, B.S., Clay County Agricultural Agent, Division of College Extension (1922, 1924).
B. S., K. S. A. C., 1914. Clay Center, Kan.

ROBERT E. WILLIAMS, B.S., Barton County Agricultural Agent, Division of College Extension (1922).
B. S., K. S. A. C., 1907. Great Bend, Kan.

WILLIAM HERBERT ROBINSON, B.S., Shawnee County Agricultural Agent, Division of College Extension (1923, 1926).
B. S., K. S. A. C., 1916. Topeka, Kan.

CLARENCE EUGENE AGNEW, B.S., Wilson County Agricultural Agent, Division of College Extension (1923, 1924).
B. S., K. S. A. C., 1923. Fredonia, Kan.

LOUIS MEYERS KNIGHT, B.S., Sumner County Agricultural Agent, Division of College Extension (1923, 1926).
B. S., K. S. A. C., 1923. Wellington, Kan.

CHARLES ENOCH LYNESS, B.S., Doniphan County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1912. Troy, Kan.

E. BRUCE BRUNSON,[6] M.S.A., Cheyenne County Agricultural Agent, Division of College Extension (1923 - Jan. 31, 1928).
B. D., Hobart College, 1911; M. S.A., Cornell University, 1914. St. Francis, Kan.

RAY LEIGHTON GRAVES, B.S., Harvey County Agricultural Agent, Division of College Extension (1923, 1925).
B. S., K. S. A. C., 1912. Newton, Kan.

GEORGE W. SIDWELL, A.B., Ness County Agricultural Agent, Division of College Extension (1918, 1923).
A. B., Fairmount College, 1915. Ness City, Kan.

SAMUEL DAVID CAPPER, B.S., Riley County Agricultural Agent, Division of College Extension (1923, 1925.)
B. S., K. S. A. C., 1921. Manhattan, Kan.

MOTT LUTHER ROBINSON, B.S., McPherson County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1923. McPherson, Kan.

HERMAN ALBERT BISKIE,[6] B.S., Nemaha County Agricultural Agent, Division of College Extension (1923-Mar. 15, 1928).
B. S., University of Nebraska, 1917. Seneca, Kan.

JUNIUS WARREN FARMER, B.S., Greenwood County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1923. Eureka, Kan.

WILLIAM O'CONNELL, B.S., Marshall County Agricultural Agent, Division of College Extension (1924).
B. S., K. S. A. C., 1916. Marysville, Kan.

RALPH REUBEN MCFADDEN, B.S. in Agr., Clark County Agricultural Agent, Division of College Extension (1922).
B. S. in Agr., K. S. A. C., 1921. Ashland, Kan.

HOWARD LORAIN GIBSON, B.S., Cherokee County Agricultural Agent, Division of College Extension (1924).
B. S., Iowa State College, 1923. Columbus, Kan.

CLARENCE GLADFELTER, B.S. in Agr., Chase County Agricultural Agent, Division of College Extension (1924).
B. S. in Agr., K. S. A. C., 1924. Cottonwood Falls, Kan.

DWIGHT ELLSWORTH HULL, B.S. in Agr., Saline County Agricultural Agent, Division of College Extension (1924; Feb. 1, 1927).
B. S. in Agr., K. S. A. C., 1917. Salina, Kan.

LEONARD NEFF, B.S.A., Cloud County Agricultural Agent, Division of College Extension (1925).
B. S. A., Purdue University, 1922. Concordia, Kan.

EDWARD AICHER, D.V.S., Harper County Agricultural Agent, Division of College Extension (1925).
D. V. S., Colorado State College, 1910. Anthony, Kan.

HARRY FORREST MOXLEY,[6] B.S., Labette County Agricultural Agent, Division of College Extension (1925-Dec. 31, 1927).
B. S., K. S. A C., 1925. Altamont, Kan.

6. Resigned.

DEWEY ZOLLIE MCCORMICK, B.S., Morris County Agricultural Agent, Division of College Extension (1925).
B. S., K. S. A. C., 1921. Council Grove, Kan.

WALTER JONES DALY, B.S., Linn County Agricultural Agent, Division of College Extension (1925; July 1, 1927).
B. S. in Agr., K. S. A. C., 1925. Mound City, Kan.

DUKE DANIEL BROWN, B.S., Jefferson County Agricultural Agent, Division of College Extension (1925, 1926).
B. S. in Agr., K. S. A. C., 1921. Oskaloosa, Kan.

GLEN MCKINLEY REED, B.S., Nemaha County Agricultural Agent, Division of College Extension (1925; Mar. 25, 1928).
B. S., K. S. A. C., 1925. Seneca, Kan.

WILLIAM SCOTT SPEER, B.S., Kingman County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1925. Kingman, Kan.

NEIL LEWIS RUCKER, B.S., Sherman County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1913. Goodland, Kan.

RICHARD LOUIS VON TREBRA, B.S., Wyandotte County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1926. Kansas City, Kan.

ARTHUR CLAIR HOFFMAN, B.S., Pawnee County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1926. Larned, Kan.

WALTER HENRY VON TREBRA, B.S., Rice County Agricultural Agent, Division of College Extension (Aug. 1, 1926).
B. S., K. S. A. C., 1924. Lyons, Kan.

WALTER HENRY ATZENWEILER, B.S., Brown County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1926. Hiawatha, Kan.

GEORGE SMITH ATWOOD, B.S., Hodgeman County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1924. Jetmore, Kan.

JOHN HENRY SHIRKEY, B.S., Meade County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1926. Meade, Kan.

JOHN HERBERT COOLIDGE, B.S., Gray County Agricultural Agent, Division of College Extension (1926).
B. S., Knox College, 1925. Cimarron, Kan.

LEA NATHAN JEWETT, B.S. Neosho County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1919. Erie, Kan.

FRED JAMES SYKES, B.S., Comanche County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1926. Coldwater, Kan.

JOHN DELMONT MONTAGUE, B.S., Marion County Agricultural Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1920. Marion, Kan.

ARTHUR WILLIAM KNOTT, B.S., Montgomery County Agricultural Agent, Division of College Extension (1927).
B. S., University of Wisconsin, 1917. Independence, Kan.

AMWEL EDWIN JONES, B.S., Dickinson County Agricultural Agent, Division of College Extension (1927).
B. S., K. S. A. C., 1917. Abilene, Kan.

RALPH PAUL RAMSEY, B.S., Jewell County Agricultural Agent, Division of College Extension (1927).
B. S., K. S. A. C., 1916. Mankato, Kan.

CARL MILTON CARLSON, B.S., Reno County Agricultural Agent, Division of College Extension (1927).
B. S., K. S. A. C., 1927. Hutchinson, Kan.

EUGENE ARTHUR CLEAVENGER, B.S., Coffey County Agricultural Agent, Division of College Extension (1927).
B. S., K. S. A. C., 1925. Burlington, Kan.

EARL CARR, B.S., Rawlins County Agricultural Agent, Division of College Extension (1927).
B. S., K. S. A. C., 1927. Atwood, Kan.

EDWARD H. LEKER, B.S.A., Leavenworth County Agricultural Agent, Division of College Extension (June 1, 1927).
B. S. A., University of Missouri, 1917. Leavenworth, Kan.

RAYMOND LUTHER STOVER, M.S., Lincoln County Agricultural Agent, Division of College Extension (June 14, 1927).
B. S., K. S. A. C., 1924; M. S., Oregon Agricultural College, 1927. Lincoln, Kan.

CHARLES ARCHER JONES, B.S., Johnson County Agricultural Agent, Division of College Extension (June 15, 1927).
B. S., K. S. A. C., 1924. Olathe, Kan.

JOHN HAROLD JOHNSON, B.S., Sedgwick County Club Agent, Division of College Extension (July 1, 1927).
B. S., K. S. A. C., 1927. Wichita, Kan.

JOHN TANTON WHETZEL, B.S., Miami County Agricultural Agent, Division of College Extension (July 1, 1927).
B. S., K. S. A. C., 1927. Paola, Kan.

THEODORE FRANKLIN YOST, B.S., Bourbon County Agricultural Agent, Division of College Extension (Oct. 17, 1927).
B. S., K. S. A. C., 1920. Fort Scott, Kan.

WALTER CARL FARNER, B.S.A., Labette County Agricultural Agent, Division of College Extension (Jan. 1, 1928).
B. S. A., University of Wisconsin. Altamont, Kan.

MELVIN CLAIR KIRKWOOD, B.S., Cheyenne County Agricultural Agent, Division of College Extension (Feb. 1, 1928).
B. S. in Agr., K. S. A. C., 1928. St. Francis, Kan.

ORVILLE RAY CALDWELL, B.S., Finney County Agricultural Agent, Division of College Extension (Mar. 12, 1928).
B. S. in Agr., K. S. A. C., 1928. Garden City, Kan.

HOME DEMONSTRATION AGENTS[1]

LAURA WINTER, Sedgwick County Home Demonstration Agent, Division of College Extension (1925).
Wichita, Kan.

FLORENCE DRESSER SYVERUD, B.S., Allen County Home Demonstration Agent, Division of College Extension (1925).
B. S., K. S. A. C., 1908. Iola, Kan.

1. In coöperation with the U. S. Department of Agriculture.

ESTHER MAE HUYCK, B.S., Rawlins County Home Demonstration Agent, Division of College Extension (1925).
B. S., South Dakota State College, 1925. Atwood, Kan.

MABEL MCCOMB, Reno County Home Demonstration Agent, Division of College Extension (1925, 1927).
B. S., K. S. A. C., 1925. Hutchinson, Kan.

ELLA M. MEYER, B.S., Franklin County Home Demonstration Agent, Division of College Extension (1925).
B. S., K. S. A. C., 1907. Ottawa, Kan.

ELIZABETH RANDLE, B.S., Douglas County Home Demonstration Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1907. Lawrence, Kan.

CHARLOTTE ELIZABETH BIESTER, B.S., Johnson County Home Demonstration Agent, Division of College Extension (1924, 1926).
B. S., University of Illinois, 1921. Olathe, Kan.

GRACE MILDRED HENDERSON, B.S., Riley County Home Demonstration Agent, Division of College Extension (1926; Mar. 15, 1928); Ford County Home Demonstration Agent, Division of College Extension (1926-Mar. 14, 1928).
B. S., University of Nebraska, 1924. Manhattan, Kan.

NELLIE MABLE BARE, B.S., Clay County Home Demonstration Agent, Division of College Extension (1926).
B. S., K. S. A. C., 1926. Clay Center, Kan.

MARTHA AMELIA RATH,[6] M.S., Bourbon County Home Demonstration Agent, Division of College Extension (1926-Oct. 31, 1927).
B. S., University of Washington, 1922; M. S., ibid., 1924. Fort Scott, Kan.

MARY ELSIE BORDER, B.S., Cherokee County Home Demonstration Agent, Division of College Extension (Feb. 7, 1927).
B. S., Ohio State University, 1926. Columbus, Kan.

HAZEL IRENE GARDNER,[6] B.S., Montgomery County Home Demonstration Agent, Division of College Extension (Feb. 7, 1927-Mar. 15, 1928).
B. S., K. S. A. C., 1923. Independence, Kan.

ANNA MONROE NEER,[6] B.S., Shawnee County Home Demonstration Agent, Division of College Extension (Mar. 15, 1927-Mar. 15,1928).
B. S., K. S. A. C., 1917. Topeka, Kan.

LOIS HOLDERBAUM, B.S., Shawnee County Home Demonstration Agent, Division of College Extension (1927; Mar. 16, 1928); Labette County Home Demonstraton Agent, Division of College Extension (May 15, 1927-Mar. 15, 1928).
B. S., K. S. A. C., 1925. Topeka, Kan.

NORA ELIZABETH BARE, B.S., Butler County Home Demonstration Agent, Division of College Extension (June 16, 1927).
B. S., K. S. A. C., 1925. El Dorado, Kan.

WINIFRED MAUDE EDWARDS, B.S., Leavenworth County Home Demonstration Agent, Division of College Extension (July 1, 1927).
B. S., K. S. A. C., 1927. Leavenworth, Kan.

HELEN FRANCES NORTHRUP, B.S., Wyandotte County Home Demonstration Agent (Sept. 1, 1927).
B. S., K. S. A. C., 1925. Kansas City, Kan.

6. Resigned.

LUCRETIA SCHOLER, B.S., Harvey County Home Demonstration Agent, Division of College Extension (Sept. 1, 1927).
B. S., K. S. A. C., 1920. Newton, Kan.

GRACE HERR, B.S., Bourbon County Home Demonstration Agent, Division of College Extension (Nov. 1, 1927).
B. S., K. S. A. C., 1922. Fort Scott, Kan.

GLYDE ESTELLA ANDERSON, B.S., Greenwood County Home Demonstration Agent, Division of College Extension (Jan. 1, 1928).
B. S., K. S. A. C., 1926. Eureka, Kan.

SARA JANE PATTON, B.S., Neosho County Home Demonstration Agent, Division of College Extension (Jan. 1, 1928).
B. S., K. S. A. C., 1915. Erie, Kan.

LEONA PETERSON, B.S., Kingman County Home Demonstration Agent, Division of College Extension (Jan. 3, 1928).
B. S., South Dakota State College, 1927. Kingman, Kan.

MARY DUNLAP ZIEGLER, Pratt County Home Demonstration Agent, Division of College Extension (Jan. 26, 1928).
B. S., K. S. A. C., 1916. Pratt, Kan.

CHRISTIE CYNTHIA HEPLER, B.S., Labette County Home Demonstration Agent, Division of College Extension (Mar. 10, 1928).
B. S., K. S. A. C., 1926. Altamont, Kan.

VERNETTA FAIRBAIRN, A.B., Montgomery County Home Demonstration Agent, Division of College Extension (Mar. 15, 1928).
A. B., University of Kansas, 1927. Independence, Kan.

EDITH ANTONETTE HOLMBERG, B.S., Ford County Home Demonstration Agent, Division of College Extension (Mar. 16, 1928).
B. S., K. S. A. C., 1908. Dodge City, Kan.

GRADUATE ASSISTANTS

LEONE BOWER KELL, B.S., Graduate Assistant in Household Economics (Feb. 6, 1927).
B. S., K. S. A. C., 1923. L 35; 727 Leavenworth.

ALMA LOUISE HOCHULI, B.S., Graduate Assistant in Education (July 1, 1927).
B. S., K. S. A. C., 1927. G 33; 818 Bertrand.

WILLIAM GERALD AMSTEIN, B.S., Graduate Assistant in Horticulture (Sept. 1, 1927).
B. S., Massachusetts Agricultural College, 1927. H 33; 1116 Bluemont.

MARY IRENE BAILEY, B.S., Graduate Assistant in Food Economics and Nutrition (Sept. 1, 1927).
B. S., University of Nebraska, 1927. L 28; 1423 Fairchild.

EARL BLACKBOURN BELSCAMPER, A.B., Graduate Assistant in Botany and Plant Pathology (Sept. 1, 1927).
A. B. College of Emporia, 1925. H 77; 1610 Laramie.

JAMES LOUIS CULBERTSON, B.S., Graduate Assistant in Animal Husbandry (Sept. 1, 1927).
B. S., Oklahoma A. and M. College, 1927. Ag 24; 1116 Bluemont.

DOROTHEA RUTH DOWD, A.B., Graduate Assistant in Zoölogy (Sept. 1, 1927).
A. B., Kalamazoo College, 1927. F 38; 1311 Laramie.

CLARA KATHRYN DUGAN, B.S., Graduate Assistant in Household Economics (Sept. 1, 1927).
B. S., Montana State College, 1927. T 52; 1923 Leavenworth.

VERNON DANIEL FOLTZ, B.S., Graduate Assistant in Bacteriology (Sept. 1, 1927).
B. S., K. S. A. C., 1927. V 54; 340 N. Sixteenth.

HAROLD IRVING HOLLISTER, B.S., Graduate Assistant in Agricultural Economics (Sept. 1, 1927).
B. S., K. S. A. C., 1927. Ag 363; 1101 Bertrand.

VINCENT CHARLES HUBBARD, B.S., Graduate Assistant in Crops (Sept. 1, 1927).
B. S., University of Minnesota, 1927. Ag 102; 830 Laramie.

ELMA SAGE JONES, B.S., Graduate Assistant in Dean's Office, Division of Home Economics (Sept. 1, 1927).
B. S., K. S. A. C., 1925. L 66; 1923 Leavenworth.

LESTER KILPATRICK, B.S., Graduate Assistant in Poultry Husbandry (Sept. 1, 1927).
B. S., Oklahoma A. and M. College, 1927. Ag 225; 1738 Fairchild.

IVA LARSON, A.B., Graduate Assistant in Zoölogy (Sept. 1, 1927).
A. B., University of South Dakota, 1927. F 38; 1311 Laramie.

ALPHA CORINNE LATZKE, B.S., Graduate Assistant in Clothing and Textiles (Sept. 1, 1927).
B. S., K. S. A. C., 1919. L 66; 344 N. Fifteenth.

ARTHUR EINAR MORTENSEN, B.S., Graduate Assistant in Soils (Sept. 1, 1927).
B. S., South Dakota State College, 1926. Ag 202; 924 Moro.

MARGARET ELIZABETH RAFFINGTON, B.S., Graduate Assistant in Foods and Nutrition (Sept. 1, 1927).
B. S., K. S. A. C., 1924. L 28; 1423 Fairchild.

FLORENCE MARGARET STEBBINS, B.S., Graduate Assistant in Zoölogy (Sept. 1, 1927).
B. S., K. S. A. C., 1927. F 38; 900 Leavenworth.

ROSS FRISBIE SUIT, B.S., Graduate Assistant in Botany and Plant Pathology (Sept. 1, 1927).
B. S., Iowa State College, 1927. H 56; 501 Sunset.

GLEN CHASE WARE,[11] B.S., Graduate Assistant in Chemistry (Sept. 1, 1927).
B. S., K. S. A. C., 1918. W 30; 1114 Vattier.

THEODORE ROOSEVELT WARREN, B.S., Graduate Assistant in Animal Husbandry (Sept. 1, 1927).
B. S. in Agr., University of Idaho, 1927. Ag 155; 1116 Bluemont.

ALDENE SCANTLIN,[9] B.S., Graduate Assistant in Household Economics (Feb. 13, 1928).
B. S., K. S. A. C., 1927.

RESEARCH ASSISTANTS

RALPH DALE NICHOLS, B.S., Research Assistant in Agricultural Economics (October 1, 1920).
B. S., K. S. A. C., 1920. Ag 348; 902 Ratone.

WESLEY GORDON BRUCE, B.S., Research Assistant in Entomology (June 1, 1927).
B. S., K. S. A. C., 1922. F 66; 1123 Laramie.

9. Temporary appointment.
11. Appointed for first semester, 1927-'28.

LUTHER OWEN NOLF, B.S., Research Assistant in Parasitology (July 1, 1927).
B S., K. S. A. C., 1926. F 27; 1014 Vattier.

ROY WINFIELD JONES, A.B., Research Assistant in Zoölogy (Sept. 1, 1927).
A. B., Oklahoma City University, 1927. F 27; 1641 Laramie.

SARAH MORRIS, B.S., Research Assistant in Institutional Economics (Sept. 1, 1927).
B. S., K. S. A. C., 1925. T 31; 817 Poyntz.

EVERETT DUANE SAYLES, A.B., Research Assistant in Zoölogy (Sept. 1, 1927).
A. B., Kalamazoo College, 1927. F 7; 1326 Fremont.

BESS MARIE VIEMONT, B.S., Research Assistant in Clothing and Textiles (Sept. 1, 1927).
B. S., Purdue University, 1921. L 67; 1641 Fairchild.

CHARLES JAMES COON,[9] D. V. M., Research Assistant in Bacteriology (Feb. 1 to Aug. 31, 1928).
D. V. M., K. S. A. C., 1924.

OTHER OFFICERS

JESSIE MCDOWELL MACHIR, College Registrar (1913).
A 29; 1641 Fairchild.

RALPH LEON FOSTER, M.S., Alumni Secretary (1924).
B. S., K. S. A. C., 1922; M. S., ibid., 1927. A 38A; 530 N. Fourteenth.

ADRIAN AUGUSTUS HOLTZ, Ph. D., Men's Adviser and Secretary of Young Men's Christian Association (1919).
A. B., Colgate University, 1909; Ph. M., University of Chicago, 1910; B. D., ibid., 1911; Ph. D., ibid., 1914. A; 520 N. Manhattan.

ETHLYN CHRISTENSEN, A.B., Secretary of the Young Women's Christian Association (1926).
A. B., University of Wyoming, 1925. L 34; 326 N. Sixteenth.

STEPHEN ARNOLD GEAUQUE, Custodian (1918, 1926).
G 1; 1014 Laramie.

LESTER HENRY DRAYER, Chief Engineer, Heat and Power Department (1916; July 1, 1927).
E 3; 531 Moro.

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9. Temporary appointment.

Standing Committees of the Faculty.

ADMISSION: Jessie McD. Machir, J. V. Cortelyou, B. L. Remick, Ina Holroyd, J. O. Hamilton, W. H. Andrews, H. L. Ibsen, Geo. A. Dean, Walter Burr.

ADVANCED CREDIT: R. R. Price, H. H. King, J. T. Willard, H. W. Davis, R. R. Dykstra, Martha Pittman, L. D. Bushnell, L. F. Payne, M. A. Durland.

ASSIGNMENT: Jessie McD. Machir, A. E. White, Araminta Holman, C. V. Williams, C. H. Scholer, W. E. Grimes, J. H. Robert.

ATHLETIC COUNCIL: F. D. Farrell, H. H. King, M. F. Ahearn, E. L. Holton, R. A. Seaton, R. I. Throckmorton, G. A. Dean.

CALENDAR: Mary P. Van Zile, J. C. Peterson, M. F. Ahearn, H. T. Hill, J. T. Willard, Maynard Brown, Ina Holroyd, Wm. Lindquist.

CATALOGUE: J. V. Cortelyou, J. T. Willard, H. W. Davis.

COMMUNITY CHEST EXECUTIVE: W. H. Andrews, Mary P. Van Zile, F. D. Farrell, A. A. Holtz, Ethlyn Christensen.

CONTROL: I. V. Iles, Albert Dickens, Margaret M. Justin, R. A. Seaton, R. R. Dykstra, Mary P. Van Zile.

EXAMINATIONS: A. E. White, C. W. Colver, R. A. Seaton.

FACULTY LOAN FUND: J. V. Cortelyou, Mary P. Van Zile, R. R. Dykstra, L. E. Call, R. A. Seaton, Jessie McD. Machir.

GRADUATE COUNCIL: J. E. Ackert, L. E. Conrad, L. E. Call, H. H. King, L. D. Bushnell, J. H. Burt, Margaret M. Justin.

MAJOR MUSICAL AND DRAMATIC ENTERTAINMENTS: J. C. Peterson, H. T. Hill, George Clammer, Ina Holroyd, Wm. Lindquist.

PUBLIC EXERCISES: J. E. Kammeyer, J. V. Cortelyou, H. W. Davis, E. L. Holton, W. H. Andrews, Wm. Lindquist.

REINSTATEMENT: R. I. Throckmorton, Margaret Ahlborn, W. M. McLeod, J. H. Robert, W. T. Stratton.

SCHEDULE OF CLASSES: A. E. White, J. T. Willard, W. T. Stratton, L. E. Conrad, W. E. Grimes, Martha Pittman.

STUDENT AFFAIRS: Mary P. Van Zile, A. A. Holtz, H. A. Shinn, L. E. Conrad, R. I. Throckmorton, A. F. Bowen, Grace E. Derby.

STUDENT HEALTH: L. E. Conrad, L. D. Bushnell, Mary P. Van Zile, C. M. Siever, M. F. Ahearn.

STUDENT HONORS: J. O. Hamilton, R. W. Conover, B. L. Remick, M. W. Furr.

VOCATIONAL GUIDANCE: Mary P. Van Zile, J. T. Willard, R. A. Seaton, R. R. Dykstra, E. L. Holton, Margaret M. Justin, L. E. Call.

Agricultural Experiment Station

OFFICERS OF THE STATION

F. D. Farrell, President of the College.

ADMINISTRATION—

L. E. Call, Director.
H. E. Shrack, Business Manager.
Hugh Durham, Assistant to Director.

AGRICULTURAL ECONOMICS—

W. E. Grimes, Farm Organization, in Charge.
Harold Howe, Land Economics.
R. M. Green, Marketing.
Morris Evans, Farm Organization.
J. A. Hodges, Farm Organization.
Homer J. Henney, Marketing Live Stock.
R. D. Nichols, Cost of Production Investigations.[1]
Harold I. Hollister, Graduate Assistant.

AGRONOMY—

R. I. Throckmorton, in Charge.
S. C. Salmon, Crops.
J. H. Parker, Plant Breeding.[1]
A. E. Aldous, Pasture Management.
F. L. Duley, Soils.
M. C. Sewell, Soils.
A. M. Brunson, Corn Breeding.[1]
J. W. Zahnley, Crops.
H. H. Laude, Coöperative Experiments.
E. S. Lyons, Soils.
C. O. Grandfield, Coöperative Experiments.
I. K. Landon, Southeastern Kansas Experimental Fields.
R. H. Davis, Soil Survey.
G. H. Phinney, Farm Foreman.
Elisabeth Harling, Seed Analyst.
L. L. Davis, Nursery Foreman.[1]
V. C. Hubbard, Graduate Assistant.
A. E. Mortensen, Graduate Assistant.

ANIMAL HUSBANDRY—

C. W. McCampbell, in Charge.
H. L. Ibsen, Animal Genetics.
B. M. Anderson, Cattle Investigations.
H. E. Reed, Sheep Investigations.
D. L. Mackintosh, Horse Investigations.
C. E. Aubel, Swine Investigations.
M. A. Alexander, Live Stock.
K. T. Risty, Graduate Assistant.
J. L. Culbertson, Graduate Assistant.

BACTERIOLOGY—

L. D. Bushnell, in Charge.
A. C. Fay, Dairy Bacteriology.
P. L. Gainey, Soil Bacteriology.
C. A. Brandly, Poultry Disease Investigations.

1. In coöperation with the U. S. Department of Agriculture.

BOTANY—

*L. E. Melchers, Plant Pathology, in Charge.[1]
E. C. Miller, Plant Physiology.
O. H. Elmer, Plant Pathology.
C. O. Johnston, Cereal Disease Investigations.[1]
Hurley Fellows, Cereal Disease Investigations.[1]
James L. Weimer, Forage Crop Disease Investigations.[1]
R. F. Suit, Graduate Assistant.

CHEMISTRY—

H. H. King, in Charge.
J. T. Willard, Consulting Chemist.
W. L. Latshaw, in Charge Analytical Laboratory.
E. L. Tague, Protein Investigations.
J. S. Hughes, Animal Nutrition.
R. W. Titus, Feeding Stuffs Analysis.
J. F. Merrill, Fertilizer Analysis.
A. T. Perkins, Soil Investigations.

DAIRY HUSBANDRY—

J. B. Fitch, in Charge.
H. W. Cave, Dairy Production.
W. H. Martin, Dairy Manufactures.
H. J. Brooks, Official Testing.
Theodore R. Warren, Graduate Assistant.

ENTOMOLOGY—

G. A. Dean, in Charge.
Ralph L. Parker, Apiculture, Fruit Insects.
J. W. McColloch, Staple Crop Insect Investigations.
Roger C. Smith, Staple Crop Insect Investigations.
R. H. Painter, Staple Crop Insect Investigations.
H. R. Bryson, Staple Crop Insect Investigations.

HOME ECONOMICS—

Margaret M. Justin, in Charge.
Martha Kramer, Food Economics and Nutrition.
Margaret Chaney, Food Economics and Nutrition.
Lilian Baker, Clothing and Textiles.
Katherine Hess, Clothing and Textiles.
Leah Ascham, in Charge Chemical Research Laboratory.
Bess Viemont, Research Assistant.
M. Irene Bailey, Graduate Assistant.

HORTICULTURE—

Albert Dickens, in Charge.
R. J. Barnett, Pomology.
W. F. Pickett, Orchard Investigations.
L. R. Quinlan, Landscape Gardening.
W. B. Balch, Floriculture and Vegetable Gardening.
Wm. G. Amstein, Graduate Assistant.

MILLING INDUSTRY—

C. O. Swanson, in Charge.
Earl B. Working, Wheat and Flour Investigations.
R. O. Pence, Milling Technology.
C. W. Oakes, Milling.

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* On leave.
1. In coöperation with the U. S. Department of Agriculture.

POULTRY HUSBANDRY—

L. F. Payne, in Charge.
D. C. Warren, Genetics.
H. H. Steup, Poultry Production.
A. P. Loomis, Superintendent of Poultry Plant.
Lester Kilpatrick, Graduate Assistant.

VETERINARY MEDICINE—

R. R. Dykstra, in Charge.
C. W. Hobbs, Field Veterinarian.
H. F. Lienhardt, Pathology.
J. P. Scott, Blackleg Investigations.
C. A. Kitselman, Abortion Disease Investigations.

ZOÖLOGY—

R. K. Nabours, in Charge.
J. E. Ackert, Parasitology.
Isabel Potter, Genetics.
G. E. Johnson, Injurious Mammals.
C. A. Gunns, Technician.
E. Duane Sayles, Research Assistant.
Roy W. Jones, Research Assistant.
L. O. Nolf, Research Assistant.

BRANCH EXPERIMENT STATIONS

FORT HAYS—

L. C. Aicher, Superintendent.
A. L. Hallsted, Dry-farming Investigations.[1]
R. E. Getty, Forage Crop Investigations.[1]
A. F. Swanson, Cereal Crops.[1]

GARDEN CITY—

F. A. Wagner, Superintendent.
E. H. Coles, Dry-land Agriculture Investigations.[1]

COLBY—

B. F. Barnes, Superintendent.[1]
J. B. Kuska, Scientific Assistant.

TRIBUNE—

T. B. Stinson, Superintendent.

1. In coöperation with the U. S. Department of Agriculture.

Engineering Experiment Station

OFFICERS OF THE STATION

F. D. Farrell, President of the College.

ADMINISTRATION—
R. A. Seaton, Director.
Louise Schwenson, Secretary.
M. A. Durland, Bulletin Editor.

AGRICULTURAL ENGINEERING—
H. B. Walker, in Charge.
W. H. Sanders, Tractors.
R. H. Driftmier, Farm Machinery.
Roy Bainer, General Investigations.
H. S. Hinrichs, Field Studies.
E. D. Gordon, Farm Machinery.

APPLIED MECHANICS—
C. H. Scholer, in Charge.
E. R. Dawley, Materials of Construction.
Harold Allen, Road Materials.

ARCHITECTURE—
Paul Weigel, in Charge.
H. E. Wichers, Rural Architecture.
*L. B. Smith, General Investigations.

CHEMICAL ENGINEERING—
H. H. King, in Charge.
W. A. Van Winkle, General Investigations.

CIVIL ENGINEERING—
L. E. Conrad, in Charge.
F. F. Frazier, General Investigations.
M. W. Furr, Highway Engineering.

ELECTRICAL ENGINEERING—
R. G. Kloeffler, in Charge.
J. L. Brenneman, Storage Batteries.
O. D. Hunt, General Investigations.
L. M. Jorgenson, Household Appliances.
H. S. Bueche, Radio Investigations.
K. P. Nowell, Radio Investigations.
G. F. Corcoran, Rural Electrification.

MACHINE DESIGN—
C. E. Pearce, in Charge.
M. A. Durland, General Investigations.
J. C. Olsen, General Investigations.

MECHANICAL ENGINEERING—
J. P. Calderwood, in Charge.
A. J. Mack, General Investigations.
B. B. Brainard, General Investigations.
C. M. Leonard, General Investigations.

* On leave, 1927-'28.

PHYSICS—

J. O. Hamilton, in Charge.
G. E. Raburn, General Investigations.

SHOP PRACTICE—

W. W. Carlson, in Charge.
G. A. Sellers, General Investigations.
E. C. Graham, Farm Shop Problems.
E. C. Jones, Machine Tools.
D. E. Lynch, Forging Practice.
R. S. Sink, Automotive Engineering.
Edward Grant, Foundry Practice.

Bureau of Research in Home Economics

OFFICERS OF THE BUREAU

F. D. Farrell, President of the College.
Margaret M. Justin, Director.

CHILD WELFARE AND EUTHENICS—
Helen Wheeler Ford, in Charge.
Jean Dobbs, Public Health.

CLOTHING AND TEXTILES—
Lilian Baker, in Charge.
Katherine Hess, Physics of Textiles.
Esther Bruner, Chemistry of Textiles.
Bessie Viemont, Assistant.

FOOD ECONOMICS AND NUTRITION—
Martha S. Pittman, in Charge.
Martha Kramer, Nutrition.
Margaret Chaney, Applied Nutrition.
Leah Ascham, Food and Nutrition.
M. Irene Bailey, Assistant.

HOUSEHOLD ECONOMICS—
Margaret M. Justin, in Charge.
Myrtle Gunselman, Household Management.

INSTITUTIONAL ECONOMICS—
Elma S. Ibsen, Institutional Economics.
Alice Mustard, Institutional Economics.

The Kansas State Agricultural College

HISTORY AND LOCATION

The Kansas State Agricultural College was established under the authorization of an act of congress, approved by Abraham Lincoln, July 2, 1862, the provisions of which were accepted by the state February 3, 1863.

Under the enabling act the College received an endowment of 90,000 acres of land and its leading object as stated by the law is—

> "Without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislature of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

The College was located at Manhattan partly in order to receive as a gift the land, building, library and equipment of Bluemont Central College, an institution that was chartered by a group of cultured pioneers, February 9, 1858. The Bluemont College building was erected in 1859.

The Agricultural College opened September 1, 1863, in the Bluemont College building. Most of the work of the College was moved to the present site in 1873. This location is adjacent to Manhattan, a city which has a residential population of ten thousand, and is unsurpassed for wholesomeness of influence by any city in the state.

The fertile valleys of the Kansas and the Blue rivers meet here, and these, with their borders of hilly upland drained by many small wooded streams, create a natural environment which is unusually attractive.

Manhattan is reached by the Union Pacific and Rock Island railways and connecting lines, and the following automobile highways: Midland Trail, Victory Highway, Golden Belt, Oklahoma City-Lincoln, Manhattan-Omaha, and state highways Nos. 13 and 29, and U. S. highways 40, 40N, and 40S. It has street-car service between the railway stations and the College, and interurban railway connection with Junction City. Practically all of the streets are paved, and an ample supply of pure water is provided.

The residents of Manhattan give most cordial support to the College and do all that could be desired to make students feel welcome, and to support them in their legitimate undertakings. The student body responds by habitually orderly and law-abiding conduct.

AIMS AND PURPOSES

The Kansas State Agricultural College has three chief aims: To give to the young men and women of Kansas a high standard of collegiate training in agriculture, engineering, home economics, general science, and veterinary medicine; to investigate, through its experiment stations, the agricultural and industrial problems of Kansas; and by means of its extension division, to carry the full benefits of the College to the remotest parts of the state.

In all the collegiate curricula particular pains are taken that each student, in connection with the scientific and technical instruction necessary to his vocation, be given thorough training in fundamental cultural subjects which promote sound thinking and good citizenship. The College aims to turn back to the state the type of citizen who is straight-thinking in all lines and a particularly valuable leader in some definite field of human activity. Its chief aim is the development of intelligent, effective leadership.

Besides the full collegiate course the College offers short courses in many fields of agricultural and industrial activity. These courses do not lead to

degrees. Their aim is to give in the shortest possible time the gist of the practical training needed by the efficient artisan.

The second important aim of the Kansas State Agricultural College is, to serve the state by investigating in a scientific manner the state's problems in agriculture and the industries. This work is accomplished through the various agricultural and engineering experiment stations. All investigational work is directly connected with the educational work of the College, so that the students are given the widest opportunity for appreciating the true value of scientific investigation. Many opportunities in the United States Department of Agriculture and in the various experiment stations of the country are thus opened to such students as show interest and skill in investigational work.

In addition to the regular instructional work conducted on the campus, the College realizes its third important aim through the Division of College Extension. This is a highly organized system of agricultural education and service carried directly to the homes of the farmers. The work has been so highly developed within the last few years that the College has come to look upon the whole state as its campus. In addition to the regular staff of the Division of College Extension, many members of the College board of instruction and the staff of the experiment stations give several weeks of each year to this public work among the people of the state.

Buildings and Grounds

The College campus occupies a commanding and attractive site upon an elevation adjoining the western limits of the city of Manhattan, with street-car service into town and to the railway stations. The grounds are tastefully laid out according to the designs of a landscape architect, and are extensively planted with a great variety of beautiful and interesting trees, arranged in picturesque groups, masses, and border plantings, varied by banks of shrubbery and interspersed with extensive lawns, gardens, and experimental fields. Broad, well-shaped, macadamized avenues lead to all parts of the grounds. Cement walks connect the buildings with one another and with the entrances. Including the campus of 147 acres, the College owns 1,420.3 acres of land at Manhattan, valued at $413,093. Outside the campus proper, all of the land is devoted to educational and experimental work in agriculture. Within the College grounds, much of the space not occupied by buildings and needed for drives and ornamental plantings is devoted to orchards, forest and fruit nurseries, vineyards, and gardens.

The more important buildings of the College are harmoniously grouped and are constructed of limestone obtained from the College quarries. These buildings are listed below, and have a total value of $2,419,000.

Anderson Hall. Erected, 1879, 1883, and 1885; cost, $79,000; dimensions, 152 x 250 feet; two stories and basement. Contains the offices of administration of the College, a social center hall, the College post office, offices of the Division of College Extension and of the Department of Student Health, and offices and classrooms of the Departments of Applied Art, Economics, English, Mathematics, and Modern Languages. It also contains the alumni and stadium offices.

Auditorium. Erected, 1904; cost, $40,000; dimensions, 113 x 125 feet. Has a large stage with drop curtain and scenery. Seating capacity, 2,300. Contains also the offices and music rooms of the Department of Music.

Calvin Hall. Erected, 1908; cost, $70,000; dimensions, 92 x 175 feet; two stories and basement. The first floor and basement are occupied by the laboratories, classrooms, and offices of the Departments of Food Economics and Nutrition, and Household Economics; the second floor is occupied by the laboratories, classrooms, and offices of the Department of Clothing and Textiles.

Chemistry Annex No. 1. Erected, 1876; cost, $8,000; dimensions, 35 x 110 feet and 46 x 175 feet, in the form of a cross. Originally erected as a chemical laboratory. Reconstructed at a cost of $5,000 after fire in 1900, the building was used from 1902 to 1911 as a women's gymnasium; since 1911, used by the Department of Chemistry.

Chemistry Annex No. 2. Erected, 1904; cost, $15,000; dimensions, 72 x 103 feet; one story and basement. Occupied by the Department of Dairy Husbandry from the time of its erection till the fall of 1923, since which time it has been used by the Department of Chemistry.

Denison Hall. Erected, 1902; cost, $70,000; dimensions, 96 x 166 feet; two stories and basement. Occupied throughout by the laboratories, classrooms and offices of the Departments of Chemistry and Physics.

Education Hall. Erected, 1900; cost, $25,000; dimensions, 90 x 95 feet; two stories and basement. Occupies original site of the president's house, destroyed by lightning in 1896. Formerly housed the Departments of Agronomy and Animal Husbandry, later the Vocational School. The abolition of the latter brought change of name in the summer of 1924. Contains class-

rooms and offices of the Departments of Education and Public Speaking and offices of the custodian.

Engineering Hall. Erected, east wing, 1909; main portion, 1920. Cost, $270,000. Dimensions: Main portion, 60 x 236 feet; east wing, 113 x 200 feet. Three stories in height, but much of the east wing is built on the gallery plan rather than by complete floor separation into different stories. This building contains the general offices and library of the Division of Engineering, and the offices, drafting rooms and laboratories of the Departments of Agricultural Engineering, Applied Mechanics, Architecture, Civil Engineering, Electrical Engineering, Machine Design, Mathematics, and Mechanical Engineering. The engines, turbines, generators and boilers that furnish heat, light and power for the College are also installed in this building.

Engineering Shops. These consist of several connected structures, erected 1875, 1890, 1900, and 1905. The original building, now used as the woodworking shop, was erected in 1875; a series of additions having later been successively made, the present group is the result. Cost of the group, $35,000. A portion of the building is two stories high. On the upper floor, which has a floor area of 9,260 square feet, are the classrooms, drafting rooms, pattern storage room, and offices of the Departments of Machine Design and Shop Practice. The woodworking shop (35 x 219 feet) is equipped with bench tools and woodworking machinery. Adjoining is the machine shop, amply equipped with modern machine tools. The blacksmith shop (50 x 100 feet) contains 30 forges of modern type, connected with power blast and down-draft exhaust. The iron foundry (27 x 100 feet) and brass foundry (24 x 34 feet) are well supplied with the necessary equipment. The wash and locker room contains 250 steel lockers. A general supply room (22 x 24 feet) is conveniently located for storing small supplies. One room is fitted up as a model farm shop and is used in the training of teachers for rural communities in accordance with the Smith-Hughes requirements.

Fairchild Hall. Erected, 1894; enlarged, 1903; cost, $67,750; dimensions, 100 x 140 feet; two stories, basement, and attic. Occupied by offices, classrooms, and laboratories of the Departments of Entomology, Zoölogy, and History and Government. The museums of natural history also are housed here. For many years, till the fall of 1927, the major part of this building was occupied by the College library.

Farm Barn. Erected, 1913; cost, $25,000; dimensions, 80 x 160 feet; two stories and basement. Consists of three sections, arranged like the letter H, and a glazed tile silo of 200 tons capacity. The west wing contains nine box stalls and twenty-six single stalls, equipped with sanitary feed mangers and racks, and is designed especially for the housing of horses. The east wing contains twelve box stalls and thirty single stalls for the breeding cattle and the show herd. The central section has an office, feed rooms, a washing floor, and a basement containing the engine room. The loft, to which a driveway leads, has storage space for ten carloads of grain and 100 tons of hay and straw and contains the grinding apparatus. The barn is used by the Department of Animal Husbandry.

Farm Machinery Hall. Erected, 1873; cost, $11,250; dimensions, 46 x 95 feet; two stories. This was the first building erected on the present campus. It was originally designed as a College barn, and first used for that purpose. It has been used as a general College building, and successively by the Department of Botany and the Department of Veterinary Medicine. The first floor, a large hall, was used for many years as an armory by the Department of Military Science. The entire building is now used by the Department of Agricultural Engineering and contains modern types of farm machinery.

Horticultural Barn. Erected, 1917; cost, $1,500; dimensions, 38 x 55 feet. Two stories, first story stone, second story frame. This building is located one mile west of the College campus.

Horticultural Hall. Erected, 1907; cost, $50,000; dimensions, 72 x 116 feet; two stories and basement. This building is used by the Departments of Botany and Plant Pathology, and Horticulture. Its classrooms, laboratories, museums, and equipment are modern and ample.

Illustrations Hall. Erected, 1876; cost, $4,000; dimensions, 32 x 80 feet; one story and basement. At an early period used as a horticultural hall; later the headquarters for general College repairs; since the summer of 1919 used by the Department of Illustrations.

Infirmary. Erected, previous to 1871; rebuilt, 1919; dimensions, 34 x 34 feet; two stories. Originally a farm house, later used as dwelling by the professor of agriculture and more recently by the custodian; has served its present use since 1919. Contains separate wards for men and women, five rooms in each ward.

Kedzie Hall. Erected, 1897; cost, $16,000; dimensions, 70 x 84 feet; two stories and basement. Used from its erection till 1908 by the Departments of Domestic Science and Domestic Art. Basement occupied by the printing plant; first floor taken up by the Department of Industrial Journalism and Printing; second floor divided into general class rooms and offices used by the Department of English.

Library. Erected, 1926; cost, $250,000; three stories and basement. The floor plan is of "T" shape, with dimensions of 183 x 46 feet and 107 x 64 feet. Three large reading rooms are provided, each 176 x 40 feet, the class reserve reading room being in the basement, the periodical room on the first floor, and the main reading room on the second floor extending through the second and third stories. The remainder of the building is devoted to stack rooms, seminar rooms, offices, working quarters, and an exhibition gallery.

Maintenance Building. Erected, 1888; cost, $5,000; dimensions, 30x30 feet; one story and basement. Used for years by Department of Horticulture and Entomology, later by the state dairy commissioner and assistants. Contains offices used by superintendent of maintenance.

Memorial Stadium. West wing erected, 1922; east wing erected, 1924; cost of portions now completed, $260,000; cost of entire structure when completed as planned, $400,000. The seating decks are constructed of reinforced concrete, the end walls are built of limestone and the back walls will be of the same material. Capacity of the seating decks now standing, 15,000; capacity of the completed structure will be 22,500. The Stadium is being built as a memorial to alumni, students, former students, and faculty of the College who participated in the World War. The cost is met entirely from funds raised by popular subscription.

Nichols Gymnasium. Erected, 1911; cost, $122,000; dimensions, 102 x 221 feet; three stories and basement. The building consists of a main section and two wings. The main section (85 x 141 feet), consisting of two stories and a basement, is used as a men's gymnasium and armory, and contains a running track, sixteen laps to the mile. The east half of the basement of the main section contains a swimming pool, baths, rest room, etc., for women; the west half contains a swimming pool and baths for men. The east wing (40 x 102 feet) contains the women's gymnasium, classrooms and offices of the Department of Military Science, and several literary society halls. The west wing (40 x 102 feet) contains the offices of the director of athletics and physical education, a large locker room for men, several literary society halls, and the radio broadcasting studio. This building is constructed on the old armory-castle type and is modern in every respect.

Thompson Hall. Erected, 1921; cost, $125,000; dimensions, 138 x 60 feet and 38 x 24 feet; two stories and basement. Basement occupied by receiving and storage rooms for the cafeteria, dishwashing room, refrigeration machinery room, pipe room, locker rooms, and bakery. The first floor is devoted to the

cafeteria, including kitchen, dining room, two offices, and lobbies. On the second floor are a tea room, with a main dining room, kitchen, three alcoves, receiving room, serving room, lobby and coat room, office, two classrooms, and the household-management laboratory.

Van Zile Hall. Erected, 1926; cost, $165,000; dimensions, 169 x 85 feet; three stories and basement. The building contains bedrooms, dining hall, kitchen facilities, and social quarters for 125 women students, besides rooms for guests, matron, and social director.

Veterinary Hall. Erected, 1908; cost, $70,000; dimensions, 133 x 155 feet; two stories and basement. Occupied by the laboratories, demonstration and dissecting rooms, classrooms, and offices of the Departments of Anatomy and Physiology, Bacteriology, Pathology, and Vaccine Laboratories, and by the offices of the dean of the Division of Veterinary Medicine.

Veterinary Hospital. Erected, 1923. Contract price, $118,000. The building is of stone and of fireproof construction throughout, with general dimensions of 145 x 146 feet. It consists of a central portion and two wings, and is two stories and an attic in height, with a basement under one of the wings. The building is used exclusively for the teaching of the practical phases of veterinary medicine and surgery. It is equipped for housing sick animals of all species, such as horses, cattle, sheep, swine, poultry, dogs, and cats. Its equipment includes an hydraulic elevator, large and small animal operating tables, cattle and horse stocks, dog kennels, operating rooms, laboratories for the diagnosis of animal diseases, etc. In addition, there are well-equipped rooms for senior students in veterinary medicine, together with a reception room for visitors, and offices for members of the veterinary clinical teaching staff.

Waters Hall. East wing erected, 1912; west wing erected, 1923; cost of portions now completed, $500,000; cost of building when developed and completed as planned, $1,000,000. Each of the wings now completed is 80 feet wide and 169 feet long and four stories high. An 80 x 50 foot one-story annex on the east wing serves as a meats laboratory, and a similar annex on the west wing serves as a creamery. A stock-judging pavilion (45 x 100 feet) is located between the two wings and is divided into two large stock-judging rooms, each having a seating capacity of 475. The two wings and the stock-judging pavilion are used by the Departments of Agricultural Economics, Agronomy, Animal Husbandry, Dairy Husbandry, Milling Industry, Poultry Husbandry, and the general offices of the Agricultural Experiment Station and of the Division of Agriculture. The equipment includes an electrically operated flour mill capable of manufacturing 75 barrels of flour a day, a modern creamery, a well-equipped meats laboratory, and modern laboratories for instructional and investigative work in seed testing, market milk, soils, field crops, farm organization, grain grading, etc.

In addition to the substantial stone buildings mentioned above, the College has a number of other buildings, among them the following:

Auto Mechanics Laboratories. Erected, 1918; dimensions, 42 x 176 feet; two stories. Built for the S. A. T. C. as mess hall (barracks No. 5). The upper floor contains a large lecture hall which is used as an assembly room for the Division of Engineering. The main portion of the building is occupied by the repair and ignition sections of the auto mechanics laboratories.

Experiment Station Building. Erected, 1918; dimensions, 40 x 176 feet; two stories. Built as barracks No. 4 for the S. A. T. C., now used by the Agricultural Experiment station.

General-purpose Building. Erected, 1918; dimensions, 40 x 80 feet; two stories. Built as barracks No. 6 for the S. A. T. C. This building is used by the Department of Electrical Engineering and as a hospital for patients with contagious diseases.

Greenhouse. Erected, 1909; cost, $7,000; dimensions, 114 x 150 feet. Contains six sections used by the various departments as follows: Horticulture, three; Botany, one; Agronomy, one; Entomology and Zoölogy, one.

Plant Museum. Erected, 1907; cost, $2,500; dimensions, 20 x 100 feet. Used by the Department of Horticulture. Contains a large number of rare growing plants, including many subtropical species.

Repair Shop. Erected, 1918; dimensions, 40 x 176 feet; one story. Built as barracks No. 1 for the S. A. T. C. Occupied by the Department of Building and Repair.

Serum Barn. Erected, 1914; cost, $3,000; dimensions, 92 x 96 feet; contains 30 pens, each 8 x 12 feet, and two feed rooms of the same dimensions. This is a frame and cement building situated three-quarters of a mile north of the College campus.

Serum Plant. Erected, 1914; cost, $7,000; constructed of brick; dimensions, 20 x 60 feet; two stories.

Traction Engine Laboratories. Erected, 1918. These are two frame buildings on concrete foundations, built originally as barracks Nos. 2 and 3 for the S. A. T. C.

Power and Water Systems. The College maintains and operates its own modern heat, light, power, water and sewer systems. A central boiler plant of 2,900 horsepower furnishes steam for both the heating system and the power plant. The central power plant contains steam engines and turbines, totalling 700 horsepower, connected to electric generators which furnish power and light for the entire campus. A complete system of underground tunnels connects the various buildings, and through these are carried the steam mains and electric cables which distribute steam and electrical energy to the different parts of the campus.

The waterworks pump house contains electric motor-driven pumps of an aggregate capacity of 600 gallons per minute. Cast-iron water mains distribute this over the campus, and a steel tank of 110,000 gallons capacity supported on a steel tower provides a reserve supply.

The College Library

The general College Library consists of all books belonging to the College, including the library of the Agricultural Experiment Station, which is incorporated with it. On June 30, 1927, the Library contained 87,000 bound volumes, besides much unbound material. It receives currently about 1,200 serial publications. As a depository the Library receives the documents and other publications of the United States government. The books are classified according to the Dewey system and are indexed in a dictionary card catalogue.

The Library is primarily for free reference use, but the privilege of drawing books is accorded to all those connected with the College as registered students or as members of the faculty. Books not specially reserved may be drawn for home use for two weeks. All books are subject to recall at any time.

General reference books, books reserved for classes, general periodicals, and certain other groups of books are to be consulted only in the reading rooms. They may not be loaned from the Library except when the reading rooms are closed. They must then be returned to the Library by the time it next reopens. Any violation of the regulations of the Library subjects the offender to a fine, or to a withdrawal of library privileges, or to both, according to the gravity of the offense. More serious offenses, such as mutilation or theft of books or periodicals, are considered just causes for suspension or expulsion of the offender, who is also required to make good the loss incurred.

Reading Rooms. Three reading rooms are maintained in connection with the Library: The general reference room, containing encyclopedias, dictionaries, atlases, bibliographies, and general reference books; the special reference room, containing books reserved for classes; and the periodical room, containing current magazines and the important daily and weekly Kansas newspapers. These rooms are freely open to the student and to the public for purposes of reading and study.

Divisional Libraries. Divisional and departmental collections are deposited in certain College buildings apart from the main Library. These collections are for the special convenience of the instructors and students of the departments concerned. They are under the direction of the librarian and are accessible to all students at regular hours.

Student Health Service

The Department of Student Health was established in order to maintain good health among the students of the College. Two doctors give their entire time and three doctors devote part time to this service. The services of the College physicians are free, but the student may employ, at his own expense, any physician he may desire. Four nurses are employed on full time and the matron of the hospital also devotes all her time to student health needs.

The offices of the department are in Anderson Hall and are open to students each school day from 7:45 a.m. to 5 p.m. It is expected that students who have need of medical services and are able to walk will go to the office, unless there is a possibility that they have a contagious disease. Those who are unable to walk to the physician's office, or who have reason to believe that they have some contagion, should go to the hospital at once.

The College hospital is ready to receive students any hour of the day or night. Free hospital service is given for three days in each case of acute sickness except smallpox. After that period a charge of one dollar a day is made. Smallpox cases are not handled at the hospital except in cases where the disease has been contracted after proper vaccination against it. Patients are admitted to the hospital only on recommendation of the head of the College medical corps. Hospital service does not include major surgical cases, such as appendicitis, hernia, etc. If such a case develops while the student is in the hospital, he will be transferred, at his own expense, to a hospital of his choice. Treatment of chronic cases by the College physicians cannot be guaranteed. However, when practicable, treatment of such cases may be undertaken on the same basis as acute cases. Fractures and dislocations of a serious nature are not treated, but minor cases may be treated at the option of the head physician. Students with fractures are admitted to the hospital.

Standard hospital nursing service is furnished free, but the student may employ, at his own expense, a private nurse at any time he desires to do so. A private nurse must obey the same rules that the College nurses are expected to follow. No ambulance service is maintained by the College, as in practically all cases of beginning sickness patients are able to ride to the hospital in an ordinary conveyance.

In order to help control contagious diseases, a student absent from classes because of illness must, before he returns to his classes, secure from the College physician a return card showing him to be free from all such diseases.

Students have the privilege of consulting any of the College physicians at any time on any question of personal hygiene of whatsoever nature.

The health office observes the same vacations and holidays as the rest of the College. Students admitted to the hospital or remaining in the hospital at a time for which the sick-benefit fee has not been paid or during Christmas holidays, will be charged the actual cost of service.

The department owns equipment valued at $8,216.

The student health service is maintained by the sick-benefit fee fund. For data concerning this fee see the section on expenses, under General Information.

Requirements for Admission

The entrance requirements of the College are made broad and flexible, only fundamental subjects being definitely required. Those requirements are made upon the supposition that high schools are local institutions in which the courses should be adapted to the needs of the individual localities, and that College entrance requirements should be such as to take the output of the high schools, rather than to determine the nature of the work offered in them.

Any person who has completed a four-year course of study in any high school or academy accredited by the State Board of Education will be admitted to the freshman class. The student should have sent in advance a certificate showing his high-school credits.

In order to carry the several curricula successfully the following subjects must have been completed.

Curricula.	*Units of fixed entrance requirements.*
Agriculture (4 years)	English, 3; science, 1; algebra, 1; geometry, 1.
Agricultural Administration (4 years)	Same as for Agriculture.
Agricultural Engineering (4 years)	English, 3; science, 1; algebra, 1½; geometry, 1½.
Animal Husbandry and Veterinary Medicine (6 years)	Same as for Agriculture.
Architecture (4 years)	English, 3; science, 1; algebra, 1½; geometry, 1½.
Architectural Engineering (4 years)	Same as for Architecture.
Chemical Engineering (4 years)	Same as for Architecture.
Civil Engineering (4 years)	Same as for Architecture.
Electrical Engineering (4 years)	Same as for Architecture.
Flour-mill Engineering (4 years)	Same as for Architecture.
General Science (4 years)	English, 3; science, 1; algebra, 1½; geometry, 1.
General Science and Veterinary Medicine (6 years)	Same as for General Science.
Home Economics (4 years)	Same as for Agriculture.
Home Economics, with stress upon Applied Art (4 years)	Same as for Agriculture.
Home Economics and Nursing (5 years)	Same as for Agriculture.
Industrial Chemistry (4 years)	Same as for General Science.
Industrial Journalism (4 years)	Same as for Agriculture.
Landscape Architecture (4 years)	Same as for Architecture.
Landscape Gardening (4 years)	Same as for Agriculture.
Mechanical Engineering (4 years)	Same as for Architecture.
Physical Education for Men (4 years)	Same as for Agriculture.
Physical Education for Women (4 years)	Same as for Agriculture.
Piano (4 years)	Same as for Agriculture.
Public-school Music (4 years)	Same as for Agriculture.
Public-school Band and Orchestra (4 years)	Same as for Agriculture.
Rural Commerce (4 years)	English, 3; science, 1; algebra, 1½; geometry, 1; and bookkeeping, ½.
Veterinary Medicine (4 years)	Same as for Agriculture.
Violin (4 years)	Same as for Agriculture.
Voice (4 years)	Same as for Agriculture.

These curricula were formulated on the assumption that the high-school subjects named will be offered for admission. Those graduates of accredited high schools who in accordance with a state law are admitted as freshmen without all of the high-school subjects that are prerequisite to carrying the curricula chosen will be assigned to the necessary subjects and allowed College credit toward graduation in them, as follows: Algebra III, two semester hours; Solid Geometry, two semester hours; Accounting, three semester hours.

Persons who are not graduates of accredited high schools or academies will be admitted to the freshman class if they have completed fifteen acceptable units of high-school work, including the fixed requirements. (A unit is defined to be the work in an accredited high school or academy in five recitation periods a week for one school year.) One who offers fourteen such units will

be admitted as a freshman, but will be conditioned in one unit. Such deficiency (whether fixed or optional requirement) must be made up the first year that the student is in attendance. If the optional requirement is not made up within that time College credits are taken in its place.

Subjects acceptable for entrance, arranged in eight groups, together with the number of units that may be offered, are shown as follows:

GROUP I—English.....	Three or four units.	
GROUP II ..... Foreign Languages.	Latin, one, two, three, or four units.	
	Greek, one, two, three, or four units.	
	German, one, two, three, or four units.	
	French, one, two, three, or four units.	
	Spanish, one, two, three, or four units.	
GROUP III ..... Mathematics.	Elementary algebra, one or one and one-half units.	
	Plane geometry, one unit.	
	Solid geometry, one-half unit.	
	Plane trigonometry, one-half unit.	
	Advanced algebra, one-half unit.	
GROUP IV ..... Natural Sciences.	Physical geography, one-half or one unit.	
	*Physics, one unit.	
	*Chemistry, one unit.	
	*Botany, one-half or one unit.	
	*Zoölogy, one-half or one unit.	
	*Physiology, one-half or one unit.	
	*General biology, one-half or one unit.	
	*General Science, one-half or one unit.	
GROUP V ..... History and Social Sciences.	Greek and Roman history, one unit.	
	Medieval and modern history, one unit.	
	English history, one unit.	
	American history, one unit.	
	Economics, one-half or one unit.	
	Sociology, one-half unit.	
	Civics, one-half or one unit.	
GROUP VI ..... Normal Training Subjects.	Psychology, one-half unit.	
	Methods and management, one-half unit.	
	Higher arithmetic, one-half unit.	
	Reviews	
	Grammar, geography, and reading, twelve weeks each, *or*	} one unit.
	Two of these, eighteen weeks each	} one unit.
	*Music, one unit.	
GROUP VII .....*Agriculture, one-half, one, two, three, or four units. Industrial Subjects.	*Drawing, one-half or one unit.	
	*Woodwork, one-half, one, or two units.	
	*Forging, one-half or one unit.	
	*Printing, one-half, one, or two units.	
	*Domestic science, one-half, one, or two units.	
	*Domestic art, one-half, one, or two units.	
GROUP VIII ..... Commercial Subjects.	Commercial law, one-half unit.	
	Commercial geography, one-half unit.	
	Bookkeeping, one-half or one unit.	
	*Stenography and typewriting, one-half or one unit each.	

DEFICIENCIES

All entrance deficiencies must be made up before the beginning of the sophomore year. Entrance requirements in Algebra and Solid Geometry may be made up by correspondence; Elementary Physics, Solid Geometry, Accounting, and Algebra III may be taken in classes provided by the College.

No student who fails or is conditioned or found deficient in any subject, or whose average grade in all subjects falls below G in any semester, is allowed to carry extra work during the succeeding semester.

No student is considered a candidate for graduation in the spring who is deficient more than nine semester hours in addition to his regular assignment at the beginning of the first semester.

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* In courses consisting of laboratory work wholly or in part, two periods of laboratory work are to be considered the equivalent of one recitation period.

ADVANCED CREDIT

At the discretion of the president, students who present certificates showing credits for college work done in other acceptable institutions are allowed hour-for-hour credit on courses in this College, in so far as they may be directly applied, or can be accepted as substitutions or electives. Candidates must present to the Committee on Advanced Standing their high-school and college credits certified to by the proper authorities. It is requested, also, that a *college catalogue covering the period of attendance be furnished with college credentials.* In cases in which it is impossible for one to furnish an acceptable certificate concerning work upon which advanced credit is asked, examinations are given, if the subject has been studied under competent instruction.

It is strongly urged that persons entering with advanced credit send to the registrar, at least two or three weeks in advance of entrance, certified transcripts of their work at other colleges.

Advanced credit in certain subjects of freshman rank may be secured by examination on account of surplus high-school units over and above the fifteen acceptable units required for admission. The registrar, on request, will furnish a statement of such surplus units to the Committee on Advanced Credit and that committee will conduct the examination within the first thirty days of the semester. Examinations, however, which affect the assignment of the first semester will be given the first Saturday of the first semester. After the expiration of the thirty-day period such examinations are authorized by the student's dean.

If the work of the student shows that advanced credits have been wrongly allowed, such credits will be revoked.

ADMISSION

Admission by Examination. Examinations for admission will be held at the College on Monday, September 10, 1928; Monday, January 28, 1929; and Friday, May 31, 1929. These examinations are given for the benefit of those students who need some additional high-school credits to qualify them for entrance to the freshman class. Applications for these examinations should be made in advance to the registrar.

Admission by Certificate. The applicant is required to submit to the Committee on Admission a certificate of the high-school or academy credit properly certified to by the authorities of the institution in which the work was done. Blanks will be furnished by the College for this purpose.

It is greatly to the advantage of the prospective student to see to it that this blank, properly filled out and *indicating the curriculum he wishes to take here,* be sent to the College as soon as possible after graduation. A permit to register will then be sent him by the registrar before the first of September. This permit *cannot be sent* unless the prospective student sees that the information as to curriculum is sent to the registrar. This will greatly facilitate the work of entrance. The student will present this permit at the registration room in Nichols Gymnasium, and will not be compelled to wait for his turn to meet the Committee on Admission.

LATE ASSIGNMENT

A considerable amount of extra work and a great deal of confusion is caused by the neglect of students to enroll at the time set for that purpose, and a fee of $5 will be charged those who are assigned after the time fixed for the close of registration.

SPECIAL STUDENTS

In recognition of the fact that experience and maturity tend to compensate, in a measure at least, for lack of scholastic attainment, the College admits as special students those who are twenty-one years of age or older, without requiring them to pass the regular examinations, provided (1) they show good

reason for not taking a regular course; (2) they be assigned only to such work as they are qualified to carry successfully; (3) they do superior work in the subjects assigned. The age limit is not applied to special students of music.

A special student is assigned by the dean of the division in which occur the major subjects to be pursued.

Special students are subject to all of the general regulations and requirements of regular students, such as assignments to physical education and military training.

KANSAS HIGH SCHOOLS AND ACADEMIES IN ACCREDITED RELATIONS WITH THE COLLEGE

(Graduates admitted without examination.)

Abbyville.
Abilene.
Ada.
Adams.
Admire.
Agenda.
Agra.
Alden.
Alexander.
Allen.
Alma.
Almena.
Altamont.
  Labette Co. Com.
Alta Vista.
Alton.
Altoona.
Americus.
Andover.
Anthony.
  Anthony.
  Spring Twp.
Antrim.
  St. John P. O.
Appanoose.
  Pomona P. O.
Arcadia.
Argonia.
Arkansas City.
Arlington.
Arma.
Arnold.
Asherville.
Ashland.
Assaria.
Atchison.
  Atchison H. S.
  St. Benedict's College Academy.
  Mt. St. Scholastica Academy.
Athens.
  Glen Elder P. O.
Athol.
Atlanta.
Attica.
Atwood.
Auburn.
Augusta.
Aurora.
Axtell.
  Axtell H. S.
  St. Michael's H. S.
Baldwin.
Bancroft.
Barclay.
Barnard.
Barnes.
Basehor.
Bavaria.
Baxter Springs.
Bazine.
Beattie.
Beeler.
Belle Plaine.
Belleville.
Belmont.
Beloit.
  Beloit H. S.
  St. John's H. S.
Belpre.
Belvue.
Bendena.
Benedict.
Bennington.
Bentley.
Benton.
Bern.
Berryton.
Beverly.
Bird City.
Bison.
Blaine.
Bloom.
Blue Mound.
Blue Rapids.
Bluff City.
Bogue.
Bonner Springs.
Brewster.
  Brewster Con. H. S.
  Brownville Con. H. S.
Bronson.
Brookville.
Brownell.
Brownville.
  Brewster P. O.
Bucklin.
Bucyrus.
  Bucyrus H. S.
  Wea H. S.
Buffalo.
Buhler.
Bunkerhill.
Burden.
Burdett.
Burdick.
  Diamond Valley.
Burlingame.
Burlington.
Burns.
Burr Oak.
Burrton.
Bushong.
Bushton.
Byers.
Caldwell.
Cambridge.
Caneiro.
Caney.
Canton.
Carbondale.
Cassoday.
Castleton.
Cawker City.
Cedar.
Cedar Point.
Cedarvale.
Centerview.
Centralia.
Chanute.
Chapman.
  Dickinson Co. Con.
Chase.
Chautauqua.
Cheney.
Cherokee.
  Crawford Co. Con.
Cherryvale.
Chetopa.
Cimarron.
Circleville.
Claflin.
Clay Center.
Clayton.
Clearwater.
Cleburne.
Clements.
Clifton.
Climax.
Clyde.
Coats.
Cockerill.
  Mulberry P. O.
Codell.
Coffeyville.
Colby.
Coldwater.
Collyer.
Colony.
Columbus.
  Cherokee Co. Com.
Concordia.
  Concordia H. S.
  Nazareth H. S.
Conway Springs.
Coolidge.
Copeland.
Corning.
Cottonwood Falls.
  Chase Co. Com.
Council Grove.
Courtland.
Covert.
Coyville.
Cuba.
Cullison.
Culver.
Cunningham.
Deerfield.
De'avan.
Delia.
  Washington Twp
Delphos.
Denison.
Densmore.
Denton.
Derby.

De Soto.
Dexter.
Dighton.
  Lane Co. Com.
Dodge City.
  Dodge City H. S.
  St. Mary of the Plains Academy.
Doniphan.
Dorrance.
Douglass.
Dover.
Downs.
Dresden.
Durlap.
Durham.
Dwight.
Easton.
Edgerton.
Edmond.
Edna.
Edson.
Edwardsville.
Effingham.
  Atchison Co. Com.
El Dorado.
Elgin.
Elk City.
Elk Falls.
Elkhart.
Ellinwood.
Ellis.
Ellsworth.
Elmdale.
Elsmore.
Elwood.
Emmett.
Emporia.
Englewood.
Ensign.
Enterprise.
Erie.
Esbon.
Eskridge.
Eudora.
Eureka.
Everest.
Fairview.
Fall River.
Falun.
Fellsburg.
Florence.
Fontana.
  Osage Twp.
Ford.
Formoso.
Fort Scott.
Fostoria.
Fowler.
Frankfort.
Franklin.
Fredonia.
Frontenac.
Fulton.
Galena.
Galesburg.
Galva.
Garden City.
Garden Plain.
Gardner.
Garfield.
Garnett.
Garrison.
Gaylord.
Gem.
Geneseo.
Geneva.
Geuda Springs.
Girard.
Glasco.
Glendale.
  Brookville P. O.
Glen Elder.
Goddard.
Goessel.
Goff.
Goodland.
  Sherman Co. Com.
Grainfield.
Great Bend.
Greeley.
Green.
Greenleaf.
Greensburg.
Grenola.
Gridley.
Grinnell.
Gypsum.
Haddam.
Halstead.
Hamilton.
Hamlin.
Hanover.
Hanston.
Hardtner.
Harlan.
Harper.
Hartford.
Harveyville.
Havana.
Haven.
Havensville.
Haviland.
  Haviland R. H. S.
  Friends Academy.
Hays.
  Hays H. S.
  Girls Catholic H. S.
  Catholic College Academy.
Hazelton.
Healy.
Hepler.
Herington.
Herndon.
Hesston.
  Hesston College Academy.
Hiawatha.
Highland.
Highland Park.
Hill City.
Hillsboro.
  Hillsboro H. S.
  Tabor College Academy.
Hoisington.
Holcomb.
Hollenberg.
Holton.
Holyrood.
Hope.
Horton.
  Horton H. S.
  St. Leo's H. S.
Howard.
Hoxie.
  Sheridan Co. H. S.
Hoyt.
Hudson.
Humboldt.
Hunter.
Hutchinson.
  Hutchinson H. S.
  St. Teresa Academy.
Independence.
Ingalls.
Iola.
Irving.
Isabel.
Jamestown.
Jarbalo.
Jennings.
Jetmore.
Jewell City.
Johnson.
  Stanton Co. Com.
Junction City.
  Junction City H. S.
  St. Xavier's H. S.
Kackley.
Kanopolis.
Kanorado.
Kansas City.
  Argentine H. S.
  Catholic H. S.
  Central H. S.
  Pembroke H. S.
  State School for Blind.
  Sumner H. S.
  Western Univ. Academy.
Keats.
Kensington.
Kincaid.
Kingman.
Kingsdown.
Kinsley.
Kipp.
Kiowa.
Kirwin.
Kismet.
La Crosse.
La Cygne.
Lafontaine.
La Harpe.
Lake City.
Lakin.
Lane.
Langdon.
Lansing.
Larned.
  Larned H. S.
  Zook H. S.
Latham.
Lawrence.
  Liberty Memorial H. S.
  Oread Training School.
Leavenworth.
  Immaculate Concept'n H. S.
  Leavenworth H. S.
  St. Mary's Academy.
Lebanon.
Lebo.
Lecompton.
Lehigh.
Lenora.
Leon.
Leona.
Leonardville.
Leoti.
  Wichita Co. Com. H. S.
Leoville.
Le Roy.
Levant.
Lewis.
Liberal.
Lillis.
Lincoln.
Lincolnville.
Lindsborg.
  Lindsborg H. S.
  Bethany Academy.
Linn.
Linwood.
Little River.
Logan.
Lone Elm.
Longford.
Long Island.
Longton.
Lorraine.
Lost Springs.
Louisburg.

Louisville.
Lovewell.
  Sinclair Twp.
Lucas.
Luray.
Lyndon.
Lyons.
McCracken.
McCune.
McDonald.
McLouth.
McPherson.
  McPherson H. S.
  Central College Academy.
Macksville.
Madison.
Mahaska.
Maize.
Manhattan.
  Manhattan H. S.
  Sacred Heart Academy.
Mankato.
Manning.
Manter.
Maplehill.
Marion.
Marquette.
Marysville.
Matfield Green.
Mayetta.
Meade.
Medicine Lodge.
Melvern.
Menlo.
Meriden.
Merriam.
  Shawnee Mission H. S.
Michigan Valley.
Midian.
Milan.
Mildred.
Milford.
Miller.
Milton.
Miltonvale.
  Miltonvale R. H. S.
  Miltonvale Wesleyan Academy.
Minneapolis.
Minneola.
Moline.
Montezuma.
Montrose.
Monument.
Moran.
Morehead.
Morganville.
Morland.
Morrill.
Morrowville.
Moscow.
Mound City.
Mound Ridge.
Mound Valley.
Mount Hope.
Mulberry.
Mullinville.
Mulvane.
Munden.
Muscotah.
Narka.
Nashville.
Natoma.
Neal.
Neodesha.
Neosho Falls.
Neosho Rapids.
Ness City.
Netawaka.
Newton.
  Newton H. S.
  Bethel Academy.
Nickerson.
  Reno Co. Com. H. S.
Norcatur.
Northbranch.
  Northbranch Academy.
North Topeka.
  Seaman H. S.
Norton.
Nortonville.
Norway.
Norwich.
Oakley.
Oberlin.
  Decatur Co. Com. H. S.
Offerle.
Oketo.
Olathe.
Olivet.
Olpe.
  St. Joseph's H. S.
Olsburg.
Onaga.
Oneida.
Osage City.
Osawatomie.
Osborne.
Oskaloosa.
Oswego.
Otis.
Ottawa.
Overbrook.
Overland Park.
Oxford.
Ozawkie.
Page City.
Palco.
Paola.
  Paola H. S.
  Ursuline Academy.
Paradise.
Parker.
Parkerville.
Parsons.
Partridge.
Pawnee Rock.
Paxico.
Peabody.
Penalosa.
Perry.
Peru.
Phillipsburg.
Piedmont.
Pierceville.
Piper.
Pittsburg.
  Pittsburg H. S.
  K. S. T. C. H. S.
Plains.
Plainville.
Pleasanton.
Plevna.
Pomona.
Portis.
Potter.
Potwin.
Powhattan.
Prairie View.
Pratt.
Prescott.
Pretty Prairie.
Preston.
Princeton.
Protection.
Quenemo.
Quincy.
Quinter.
Radium.
Ramona.
Randall.
Randolph.
Ransom.
Rantoul.
Raymond.
Reading.
Reece.
Republic.
Reserve.
Rexford.
Richmond.
Riley.
Riverton.
Robinson.
Rock Creek.
Rolla.
Rosalia.
Rosedale.
Rose Hill.
Rossville.
Roxbury.
Rozel.
Russell.
Russell Springs.
Sabetha.
Saffordsville.
  Toledo Twp. H. S.
St. Francis.
  St. Francis Com. H. S.
St. Francis H. S.
  St. Paul P. O.
St. George.
St. John.
  St. John H. S.
  Antrim R. H. S.
St. Marys.
  St. Marys H. S.
  St. Marys College Academy
  Immaculate Concept'n H. S.
St. Paul.
  St. Francis H. S.
Salina.
  Salina H. S.
  Sacred Heart H. S.
  Marymount Academy.
Satanta.
Savonburg.
Sawyer.
Scandia.
Scott City.
Scottsville.
Scranton.
Seaman.
  North Topeka P. O.
Sedan.
Sedgwick.
Selden.
Seneca.
  Seneca H. S.
  Sts. Peter and Paul H. S.
Severance.
Severy.
Shallow Water.
Sharon.
Sharon Springs.
  Wallace Co. Com. H. S.
Shawnee Mission.
  Merriam P. O.
Silver Lake.
Simpson.
Smith Center.
Smolan.
Soldier.
Solomon.
South Haven.
South Hutchinson.
  Hutchinson P. O.
Sparks.
Spearville.
Speed.
Spivey.
Spring Hill.

Spring Twp.
  Anthony P. O.
Stafford.
Stanley.
Stark.
Sterling.
Stilwell.
Stockdale.
Stockton.
Strawn.
Sublette.
Summerfield.
Sun City.
Sylvan Grove.
Sylvia.
Syracuse.
Talmadge.
Tampa.
Tescott.
Thayer.
Tipton.
Tonganoxie.
Tonovay.
  Utopia P. O.
Topeka.
  Topeka H. S.
  Bethany Academy.
  Catholic H. S.
  Highland Park H. S.
  Kansas Vocational School.
  Washburn R. H. S.
Toronto.
Towanda.
Tribune.
  Greeley Co. H. S.
Trousdale.
Troy.
Turner.
Turon.
Tyro.
Udall.
Ulysses.
  Grant Co. Com. H. S.
Utica.
Valley Center.
Valley Falls.
Vermillion.
Vernon.
Vesper.
Victoria.
  St. Fidelis H. S.
Vilas.
Vinland.
Viola.
Virgil.
Wakeeney.
  Trego Com. H. S.
Wakefield.
Waldo.
Wallace.
Wallace Co. Com. H. S.
  Sharon Springs P. O.
Walnut.
Walton.
Wamego.
Washburn R. H. S.
  Topeka P. O.
Washington.
Washington Twp. H. S.
  Delia.
Waterville.
Wathena.
Waverly.
Wayside.
Wea.
  Bucyrus P. O.
Webber.
Webster.
Weir.
Welborn.
  Kansas City, Kan., P. O.
Welda.
Wellington.
Wellsville.
Weskan.
West Mineral.
Westmoreland.
Westphalia.
Wetmore.
Wheaton.
White City.
White Cloud.
Whitewater.
Whiting.
Wichita.
  Wichita H. S.
  American Indian Institute.
  Cathedral H. S.
  Mt. Carmel Academy.
  St. John's Academy.
Wilburton.
Williamsburg.
Willis.
Wilmore.
Wilsey.
Wilson.
Winchester.
Windom.
Winfield.
Winona.
Woodbine.
Woodruff.
Woodston.
Yates Center.
Zenda.
Zook.
  Larned P. O.

JUNIOR COLLEGES

Every junior college student who expects to complete his education at this College is urged to model his course in junior college in such a way as to meet all of the requirements for the particular curriculum which he expects to pursue here. Different curricula have different prerequisites; but admission to advanced standing in the College is reasonably flexible, hour-for-hour credit being given for two years' work wherever the work done in an accredited junior college can be directly applied or can be accepted as substitutions or electives in the curriculum chosen. If the work done in junior college has been carefully selected with regard to the curriculum to be pursued here, the average junior college graduate carrying the maximum assignment can usually complete the requirements for the degree of Bachelor of Science in two additional years.

Detailed statements as to the requirements for graduation in each of the several curricula at the College may be found in other sections of this catalogue.

Kansas Junior Colleges in Fully Accredited Relations with the College

PUBLIC

Arkansas City Junior College, Arkansas City.
Coffeyville Junior College, Coffeyville.
El Dorado Junior College, El Dorado.
Fort Scott Junior College, Fort Scott.
Garden City Junior College, Garden City.
Independence Junior College, Independence.
Iola Junior College, Iola.
Kansas City Junior College, Kansas City.
Parsons Junior College, Parsons.

PRIVATE

Central Academy and College, McPherson.
Hesston College, Hesston.
Highland Junior College, Highland.
Kansas City University, Kansas City, Kan.
Mt. Saint Scholastica, Atchison.
Paola Junior College, Paola.
St. Marys Junior College, Leavenworth.
Tabor College, Hillsboro.

Undergraduate Degrees and Certificates

For graduation, one must complete one of the four-year curricula as shown elsewhere. These are believed to provide for the necessities of most students who seek an institution of this kind, and departures from the specified work are not encouraged. Under special conditions, however, such College substitutions are allowed as the interests of the student demand. The total requirement, including military science or physical training, is about 134 hours, or semester credits, a semester credit being one hour of recitation or lecture work, or three hours of laboratory work a week, for one semester of eighteen weeks. A student, to be considered as a candidate for graduation, must have done his last year's work in residence. Not less than 20 semester hours of undergraduate work must be taken here while this residence requirement is being fulfilled. Not to exceed 16 semester hours of a student's last year's residence work may be taken for graduate credit, provided that all undergraduate requirements will have been satisfied by the close of the second semester of the year of graduation. In special cases candidates would be considered who have done three full years of work here and have done their last year of work in an institution approved by the faculty.

Candidates desiring to be graduated must make application to the registrar at least 30 days before the date that graduation is expected. The responsibility rests with a candidate to see that he has complied with all of the requirements.

Candidates for graduation or for advanced degrees are required to be present in person, unless arrangements have been made in advance for the conferring of the degree in absentia. Application for this privilege should be made to the student's dean. Candidates for graduation are required to be present at the exercises of baccalaureate Sunday unless excused by the council of deans.

DEGREES

The degree of Bachelor of Science (B. S.) is conferred upon those who completed the four-year curriculum in agriculture, agricultural administration, agricultural engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, flour-mill engineering, architecture, architectural engineering, landscape architecture, home economics, industrial journalism, industrial chemistry, physical education, rural commerce, or general science, or the five-year curriculum in home economics and nursing.

The degree of Bachelor of Music (B. M.) is conferred upon those who have completed one of the four-year curricula in music.

The degree of Doctor of Veterinary Medicine (D. V. M.) is conferred upon those who have completed the four-year curriculum in veterinary medicine.

Upon those who have completed the six-year curriculum in animal husbandry and veterinary medicine or the six-year curriculum in general science and veterinary medicine the B. S. degree is conferred when the first four years are completed and the D. V. M. degree is conferred upon completion of the remaining two years of the curriculum.

CERTIFICATES

An appropriate certificate is granted upon completion of any one of the following:

1. First two years of the curriculum in public-school music.
2. Any one of the one-year or two-year courses in trades related to engineering.
3. The farmers' short course.
4. Any one of the dairy-manufacturing short courses.

Graduate Study

THE ADMINISTRATION OF GRADUATE COURSES

The administration of the graduate courses is vested in the Graduate Council. This body consists of seven members, selected from the following divisions of the College: Agriculture; Engineering; General Science; Home Economics; and Veterinary Medicine. The members of the Graduate Council are appointed and its chairman designated by the President.

The graduate faculty consists of the President of the College, the deans of the academic divisions, and the staff members recommended by the department heads and approved by the Graduate Council as qualified to give graduate instruction. Its chairman is the President of the College; and its secretary, the secretary of the Graduate Council. The graduate faculty offers all graduate courses, and at the call of the chairman holds meetings for the consideration and adoption of general rules of procedure in the administration of the graduate work.

The Graduate Council determines, subject to the authority of the President of the College and the Board of Regents, and in accordance with any general regulations adopted by the graduate faculty, matters of curriculum, admission to graduate study and to candidacy to advanced degree, and other matters which relate to the proper administration and development of graduate work in the College.

ADMISSION

Admission to graduate courses is granted to graduates of institutions whose requirements for the bachelor's degree are substantially equivalent to those of the Kansas State Agricultural College. Admission to the graduate courses, however, may not be construed to imply admission to candidacy for an advanced degree. Such candidacy is determined by the Graduate Council upon the recommendation of the major instructor after the student has demonstrated by his work for a period of two months or longer that he has the ability to do major work of graduate grade. A mere accumulation of grades will not lead to a degree.

Application blanks for admission to graduate courses may be secured from the chairman of the Graduate Council. Every applicant for admission must submit with his application an official transcript of his college record.

REGISTRATION

Students applying for graduate work should present themselves to the chairman of the Graduate Council at Nichols Gymnasium during the regular registration days (see College calendar), and at other times at his office, room 27, Fairchild Hall.

Students who have been admitted to the graduate courses are required to register with the College registrar and with the chairman of the Graduate Council, at the beginning of each semester, unless special permission for later registration has been granted by the chairman of the Graduate Council. Credit toward the fulfillment of the residence requirements dates from the time of registration and not from the beginning of the semester when the student enters.

DEGREES

Of the advanced academic degrees, the Master of Science degree is conferred. The following profesional degrees are conferred: Agricultural Engineer, Architect, Architectural Engineer or Landscape Architect, Chemical Engineer, Civil Engineer, Electrical Engineer, Flour Mill Engineer and Mechanical Engineer.

CANDIDACY FOR MASTER'S DEGREE

Candidates for the degree of Master of Science (M.S.) are required to spend at least one collegiate year in residence, except under certain special conditions when the residence may be reduced to one and one-half semesters. The equivalent of thirty-two semester credits, including a thesis, must be satisfactorily completed. Not more than sixteen credits, including thesis, may be secured in a single semester. Students holding graduate assistantships may not obtain more than twelve credits, including thesis, in one semester.

Grades. Graduate students' work is graded in five classes: E. G. M. P. and F. The last indicates a failure. P indicates unsatisfactory though passable work. The degree will not be conferred on any student who does not receive a grade of G or higher in three-fourths of the courses taken, including thesis. A failure or absence from examination in any course may prevent the conferring of the degree, and failure in any course in the major field precludes conferring the degree in the same year.

Language Requirements. A reading knowledge of two modern languages is highly desirable.

Master's Thesis. Each candidate for a master's degree is required to present a thesis on some subject approved by the Graduate Council upon the recommendation of the instructor in charge of his major work.

The thesis ordinarily demands one-fourth of the student's time and may not exceed one-third of it. The thesis and special reports upon it must be prepared in accordance with specifications to be obtained from the office of the chairman of the Graduate Council. (See College calendar for dates.)

A candidate for the master's degree is subject to a rigid oral examination covering his major and minor subjects and thesis by a committee consisting of the dean of the division in which his major subject was taken, a member of the Graduate Council, and the instructors with whom he has taken his major and minor work.

PROGRAM OF STUDY

In carrying graduate work, the student is expected to assume the initiative and the responsibility. It is important to recognize that graduate work does not consist in the fulfillment of routine requirements alone. The various courses as well as the assistance and advice of the instructors are to be regarded simply as aids in acquiring the methods, discipline, and spirit of independent research.

Each candidate for a degree is expected to have a wide knowledge of his subject and of related lines of work. This is usually obtained only by a wide range of private reading and study outside the immediate field covered by the formal courses to which he may be assigned.

The branch of knowledge to which the student expects to devote the larger part of his time is termed his major subject. The other fields of study selected, which will necessarily be more restricted in scope, are termed minor subjects. The latter should be chosen with reference to their direct bearing on the major subject.

Approximately two-thirds of the student's time is devoted to his major subject and one-third to one or more minor subjects. The word subject is used to designate a recognized field of study, and is not defined by the limits of a department. The nature and distribution of the majors and minors are approved by the Graduate Council, upon the recommendation of the major instructor.

The program of study suggested by the major instructor and approved by the Graduate Council is made the basis of the formal assignment to courses at the beginning of each semester and of the summer sessions.

It will be noted that in the announcements of the various departments of the College, certain courses are open to both graduate and undergraduate students. For graduate credit in such courses, the student must do extra

work. No credit earned during the undergraduate course may be counted for graduate credit, unless registered, at the time taken, with the chairman of the Graduate Council as credits in excess of those required for the bachelor's degree.

VACATION CREDIT

Upon the recommendation of his major instructor a student not registered in the College may accumulate a limited number of graduate credits in problem or research courses during either semester, the first summer school, or the period between the close of the first summer school and the beginning of the next succeeding semester under the following provisions: (1) The approval of the Graduate Council must be secured. (2) The work must be done under the supervision of a member of the graduate faculty.

The credits so earned will be included on the student's next regular assignment marked "vacation credit" and will be in addition to the regularly allowed number of credits assigned. Such credits will be forwarded to the registrar by the instructor as soon as the latter receives the class cards after the beginning of the next semester.

GRADUATE ASSISTANTSHIPS

In order to encourage graduates of this and similar institutions to continue their studies and to pursue advanced work leading to a master's degree, the College has established graduate assistantships in several departments. No graduate assistant may receive more than twelve graduate credits per semester nor satisfy the residence requirements in less than two semesters and one first summer school.

Graduate assistantships, paying a salary fixed each year by the Board of Regents, have been established as follows:

Subject.	*Number.*
Agricultural Economics	1
Agronomy	2
Animal Husbandry	2
Bacteriology	1
Botany and Plant Pathology	2
Clothing and Textiles	2
Dairy Husbandry	1
Education	2
Food Economics and Nutrition	1
Home Economics	1
Horticulture	1
Household Economics	1
Institutional Economics	1
Poultry Husbandry	1
Zoölogy	3

RESEARCH ASSISTANTSHIPS

Research assistantships as listed below usually are maintained in the departments named. Occupants of these positions assist in the conduct of regular research work of the institution.

Subject.	*Number.*
Agricultural Economics	1
Agronomy	1
Animal Husbandry	1
Bacteriology	1
Botany and Plant Pathology	1
Clothing and Textiles	1
Dairy Husbandry	1
Education	1
Entomology	2
Food Economics and Nutrition	2
Horticulture	1
Household Economics	1
Poultry Husbandry	1
Zoölogy	4

By satisfactorily completing eight credits of graduate work in the first summer session, graduate assistants may meet the requirements for a master's degree within one calendar year.

Appointments for all assistantships are made annually in March, or soon thereafter, for the following year. Students desiring such appointments may obtain application blanks from the chairman of the Graduate Council.

SENIORS AND GRADUATE STUDY

A senior who has completed so much of his work for the bachelor's degree that his program for the year is not full may, with the consent of his dean and of the Graduate Council, be assigned to one or more courses for graduate credit. In no case shall such combination of courses exceed the number of credit hours of a normal senior assignment for his curriculum.

GRADUATE WORK IN THE SUMMER SESSIONS

Graduate students desiring to do a part or all of the work for the master's degree in the summer may complete the residence requirements, in certain lines only, by pursuing graduate work for four first summer sessions. Persons interested should correspond with the chairman of the Graduate Council in advance. In special cases it may be possible to complete the residence requirements for the master's degree as indicated above under "Candidacy for Master's Degree."

A detailed statement concerning the graduate work in the Summer Schools may be obtained by applying to the dean of the Summer School, Kansas State Agricultural College, Manhattan, Kan.

CANDIDACY FOR PROFESSIONAL DEGREES

ENGINEERING AND ARCHITECTURE.

Graduates in engineering or in architecture from this College previous to 1917 who have been engaged in engineering or architectural practice for a period of five years or more, and graduates in 1917 or later who have been engaged in engineering or architectural practice for a period of three years or more, will be granted the professional degree of Mechanical Engineer, Civil Engineer, Chemical Engineer, Electrical Engineer, Agricultural Engineer, Flour Mill Engineer, Architect, Agricultural Engineer or Landscape Architect, under the following conditions:

The graduate to be eligible to a degree must submit a statement of his experience and a thesis covering some phases of his practice. This thesis and experience must be approved by the head of the department in which the degree is requested, by the dean of the Division of Engineering, and by the Graduate Council, before the granting of such a degree will be recommended to the College Faculty and to the Board of Regents.

A candidate must declare his candidacy and file with the dean of the Division of Engineering a detailed statement of his professional study and experience, and an outline of his proposed thesis, not later than the November 15 next preceding the June commencement at which the degree is to be conferred.

A preliminary copy of the completed thesis must be submitted for criticism not later than April 1, and the final copy in duplicate must be submitted not later than May 15.

Candidates for professional degrees shall present themselves at the commencement exercises in order that the degrees may be conferred.

A diploma fee of $10 shall be paid by each candidate to the registrar not later than May 15.

THE GRADUATE CLUB

The Graduate Club is an organization composed of graduate students and members of the graduate faculty. Its purpose is to promote sociability and wide acquaintance among its members.

General Information

DUTIES AND PRIVILEGES

Good conduct is expected of all students. Aid and stimulus toward the development of good character is given by the Christian organizations of the College and the town and by the College itself. Every student is expected to render a good account of himself in the College community life. College discipline is confined chiefly to sending away those whose conduct, after fair trial, makes their further attendence at the College unprofitable or inadvisable.

In order that a fine type of democratic sociability may be fostered among students and faculty, a large community recreation and rest center is provided in Anderson Hall, the administrative building. This center, one of the largest rooms on the campus, is furnished with divans, arm chairs, and writing tables in wicker and is neatly and beautifully decorated. During vacant hours and between classes, students and faculty gather here for rest and conversation. The room is available for student and faculty receptions and parties during the late afternoon and the evening hours.

Absences from class or laboratory must be accounted for to the instructor concerned. Permission for absence from College for one or more days must be secured in advance from the dean of the division in which the student is registered. Students cannot honorably leave the College before the close of a semester except by previous arrangement with the deans concerned.

Opportunities for general scientific, literary, musical, and forensic training are afforded, in addition to the College courses, by various societies and clubs, which are described elsewhere in the catalogue and afford excellent training in their diverse lines.

At various times during the year College halls are opened for social, literary, musical, and dramatic entertainments furnished by lecture courses, by the literary societies, by the Department of Music, by the Dramatic Club, by the Oratorical Association, and by other organizations of students and instructors. Addresses by prominent speakers, men of affairs, and persons prominent in scientific, educational, and social work are of frequent occurrence.

EXPENSES

Tuition. There is no charge for tuition. Class instruction in music is free, but fees are charged for individual instruction. (See Department of Music for statement of fees for music.)

Matriculation Fee. A matriculation or entrance fee of $10 for residents of Kansas, or $15 for nonresidents, is charged all students in College curricula. This fee is not charged summer school students, short course students, or students in trade courses, but is payable by special students in the College.

Incidental Fee. An incidental fee of $25 a semester or $20 a summer term is charged residents of Kansas; nonresidents pay $37 a semester or $25 a summer term. Students in short courses of more than eight weeks' duration pay an incidental fee of $10. Eight-week short-course students pay an incidental fee of $5; the incidental fee for the two-week short courses is $3. The incidental fee for the second summer term is $10.

Student-health Fee. Each student in the College pays a student-health fee of $3 a semester or $1.50 a summer term. Students in short courses of more than eight weeks' duration pay a student-health fee of $3. For students in the short courses, lasting eight weeks only, this fee is $1.50.

The student-health fee entitles the student to receive the services of the College physician for any illness contracted while in College. It also includes

the cost of medicine, and free hospital service up to three days. The fee does not include the cost of surgical operations, reduction of fractures, or the treatment of chronic conditions.

As in the case of all other fees, the College reserves the right to change this fee or to modify the benefits given for it, without previous notice.

The College maintains on the campus a contagion hospital having separate wards for men and women. This hospital is in charge of a matron who resides continuously in the building and cares for the patients, under the direction of the College physician. Students, when suffering from or suspected of having any contagious disease, except smallpox, are admitted to the hospital on the recommendation of the College physician. The student's only expense for hospital service is a fixed charge of $1 a day, after three days of free service. The aim of the College in providing this hospital is to prevent contagious diseases among the students and, in case the student should contract such a disease, to make it unnecessary to quarantine a rooming house where there are many students.

Student-activity Fee. Each student pays a student-activity fee of $5 a semester. This fee is imposed by the vote of the students themselves, and at their request is collected by the College at the beginning of each semester along with the fees levied by the state. Payment of this fee admits the student to all athletic events, to all intercollegiate debates and oratorical contests, and to band concerts, and gives membership in the Student's Governing Association. The members of the faculty and the employees of the College are allowed the privilege of participation in the activity-fee plan.

Recapitulation. To make plain to prospective students the amount of fees due at the opening of the College year in accordance with the statements of the above paragraphs, the following tabular statement is given:

FOR RESIDENTS OF KANSAS

	Old students.	*New students.*
Matriculation (paid only once)	None.	$10.00
Incidental (one semester)	$25.00	25.00
Student-health (one semester)	3.00	3.00
Student-activity (one semester)	5.00	5.00
Totals	$33.00	$43.00

FOR NONRESIDENTS OF KANSAS

	Old students.	*New students.*
Matriculation (paid only once)	None.	$15.00
Incidental (one semester)	$37.00	37.00
Student-health (one semester)	3.00	3.00
Student-activity (one semester)	5.00	5.00
Totals	$45.00	$60.00

FOR ALL SHORT-COURSE STUDENTS

	2 weeks.	*8 weeks.*	*9-16 weeks.*
Incidental	$3.00	$5.00	$10.00
Student-health	None.	1.50	3.00
Totals	$3.00	$6.50	$13.00

Late Assignment Fee. For assignment after the close of the regular registration period the student is charged $5. *There is no exception to this rule.*

Laboratory Expense. In all laboratories students are required to pay for supplies used and for apparatus broken or lost. The cost in the several subjects ranges from 50 cents to $10 a semester. These charges, effective September 1, 1928, are noted under the descriptions of the several courses. In the special courses related to engineering, the laboratory charges are fixed at from $18 to $36 for the entire course.

Commencement Fee. On graduation students pay a commencement fee of $10 to cover the cost of the diploma and other commencement expenses.

PAYMENT OF FEES. The matriculation fee is paid upon admission to the College. The incidental fee, the student-health fee, laboratory fees, and the student-activity fee are payable at the beginning of each semester.

FEE RECEIPTS ARE TO BE SAVED. Receipts for fees must be shown to the assigner at the beginning of each semester before a student is permitted to take out his assignment. First semester fee receipts are to be saved by the students and presented at second semester registration.

REFUND OF FEES. *No refund is made on the matriculation fee.* Certain refunds are made on other fees, as shown below, and *no exceptions are made to these rules.*

A student permitted to withdraw on or before the end of the first one-fourth of a semester or summer term may receive a refund of one-half the fees paid for that semester.

A student permitted to withdraw after remaining one-fourth and less than one-half semester or summer term may receive a refund of one-fourth the fees paid for that semester.

Refund is made on the unused portion of laboratory fees.

Refunds are given *only* on the presentation of the fee receipt for various fees paid. Refunds are authorized at the office of the registrar. *Fee receipts must be preserved* by the student.

A student dropping music before the end of a term or semester may receive a refund of fees paid corresponding to the remaining time of the first three-fourths of the term or semester; that is, the fees for at least the last one-fourth of a term or a semester are retained.

TEXTBOOKS. The cost of textbooks varies considerably from semester to semester and according to the curriculum pursued. The following tabulation shows the approximate cost of books required during the freshman year.

Curriculum.	*First semester.*	*Second semester.*
Agriculture	$23.70	$5.95
Agricultural Engineering	21.15	8.10
Architecture	14.45	4.75
Civil Engineering	22.15	4.75
Electrical Engineering	20.50	10.95
Flour-mill Engineering	11.50	11.25
General Science	16.60	4.45
Home Economics	21.25	8.65
Industrial Journalism	10.40	.10
Mechanical Engineering	16.00	8.75
Rural Commerce	10.25	4.50
Veterinary Medicine	27.90	3.00

DRAWING INSTRUMENTS. In several curricula, especially in architecture and engineering, drawing instruments are required. These range in price from $7.50 to $25.00 a set.

GYMNASIUM SUITS. Each young woman taking physical training must have an approved gymnasium suit costing about $4.50. Complete gymnasium suits for young men cost about $5.

MILITARY UNIFORM. Each student required to take military training must have a uniform. However, he will receive from the government a special allowance toward its purchase.

ROOMS. Rooms are not furnished by the College. They are readily obtained in the city at a cost of from $10 to $15 a month for a room suitable for two occupants. Less desirable quarters and less desirable locations may be obtained at a lower rate. There are great differences in the accommodations offered. Those for which the higher prices are charged are modern in all respects, and light, heat, and bath are included in the cost stated.

BOARD. The cost of board depends largely upon individual requirements. In clubs and private boarding houses the cost is usually from $5 to $7 a week.

Students may board themselves at a smaller money outlay. The College operates a first-class cafeteria, where all meals may be obtained, except on Sundays, at moderate prices. Food is furnished at cost and the expense to the student depends upon the care and judgment which he employs.

LAUNDRY. The expense for laundry may be estimated at 40 cents to 70 cents a week, depending upon individual requirements.

BOARDING AND ROOMING HOUSES

The Christian Associations of the Agricultural College keep on file the official list of boarding and rooming houses. All correspondence relative to boarding accommodations, in advance of the student's arrival in Manhattan, may be addressed to the secretary of the Young Men's Christian Association, to the secretary of the Young Women's Christian Association, or to the registrar of the College. Upon arrival in Manhattan, young men should go directly to the office of the Y. M. C. A. secretary in Anderson Hall on the College campus. Young women upon arrival should go directly to the Y. W. C. A. offices in Calvin Hall on the campus. Taxi service may be had from either station.

For three days before the opening of the fall semester and for the first three days after the opening day, committees from these associations meet trains and assist in directing new students, either to the association offices or directly to proper boarding places. The associations make no charge for their services or for lists of all approved boarding places, and new students should depend absolutely upon the recommendations of the association committees.

Van Zile Hall, a dormitory for women students, is located on the campus. It accommodates one hundred twenty-five women. It is a beautifully furnished, well-equipped, fireproof building of stone. Applications for rooms are considered in the order in which they are received. To validate an application for residence in the Hall a deposit of $10 is required. This amount is credited on the first payment for room and board, or is refunded provided request is made to the dean of women by August 1. The contract for room and board in Van Zile Hall is for a full semester (eighteen weeks) and the obligation is canceled only for reasons satisfactory to the dean of women. All correspondence in regard to the dormitory should be addressed to "Dean of Women, Kansas State Agricultural College, Manhattan, Kan."

SELF-SUPPORT

The courses of instruction are based upon the supposition that the student is here for study. Therefore a proper grasp of the subjects cannot be obtained by the average student unless the greater part of his time is given to College work. Students of limited means are encouraged and aided in every possible way, but unless exceptionally strong, both mentally and physically, such students are advised to take lighter work by extending their courses, in case they are obliged to give any considerable time to self-support. As a rule, a student should be prepared with means for at least a semester, as some time is required in which to make acquaintances and to learn where suitable work may be obtained.

There are various lines in which students may find employment. The College itself employs labor to the extent of about $1,200 a month, at rates varying from 20 to 35 cents an hour, according to the nature of the employment and the experience of the employee. Most of this labor is upon the College farm, in the orchards and gardens, in the shops and the printing office, for the janitor, etc. Various departments utilize student help to a considerable extent during the vacations. Students demonstrating exceptional efficiency, ability and trustworthiness obtain limited employment in special duties about the College. Many students secure employment in various lines in the town, and some opportunity exists for obtaining board in exchange for work, with families either in town or in the neighboring country.

Labor is universally respected in the College community, and the student

who remains under the necessity of earning his way will find himself absolutely unhampered by discouraging social conditions. Indeed, over one-third of the students support themselves wholly, while a third support themselves in part. False standards regarding physical work do not exist, and are not tolerated by the board of instruction or by the student body as a whole. Absolutely democratic standards prevail at the College, and students are judged on the basis of their personal worth and efficiency alone.

Students are assisted to obtain employment by means of the employment bureaus maintained by the Young Men's Christian Association and by the Young Women's Christian Association of the College, with the secretaries of which organizations correspondence is encouraged.

STUDENT LOAN FUNDS

The Alumni Loan Fund. The Alumni Association of the Kansas State Agricultural College has created a loan fund, chiefly by means of payments by which the alumnus is relieved from further regular dues in the association. Members are due to pay the association $3 a year, and on payment of $50 in one sum they are relieved from such dues. If a husband and wife are both eligible to membership, joint membership may be obtained by payment of $75. The fund so created, amounting now to about $12,550 is lent to students at 6 per cent per annum. The fund is administered by a committee appointed by the directors of the Alumni Association. The committee announces no specific rules governing the granting of loans, but in general gives preference to junior and senior students, and to loans of smaller amounts on short time over larger amounts which cannot be paid for several years. Alumni are urged to take life memberships and thus add to the funds available to worthy students. Students wishing loans from this fund may address Dr. W. E. Grimes, chairman of the Alumni Loan Fund Committee, Manhattan, Kan.

Acknowledgment of additions to the Life Membership Fund is made at this place from year to year. Since the last report and up to January 14, 1928, the following-named persons have completed payments for life membership: Doris Dwelly, Bess Pyle Springer, Twyliah Springer Gaskill, Penelope Burtis, David Fairchild, Geneva Faley, E. E. Truskett, L. V. Sanford, C. E. Morlan, P. R. Carter, H. H. Haymaker, A. S. Kinsley, W. G. Speer, Eleanor Nelson, Myrtle Gunselman, Floyd Swim, Hazel Gardner, Ivan A. White, H. C. Seekamp, Rushton Cortelyou, Louise Hattery, Mamie Grimes, Lowell Barr, T. L. Barr, D. W. Working, B. H. Luebke, Meda Masterson Nelson, Bernard Melia, Ruth Long, C. L. Farrar and Gerald Ferris. Many others have made partial payments.

Joint memberships have been taken by J. J. Frey and Mina Dyer Frey. Vilona Cutler added $300 to her previous contribution of $700 to the endowment fund.

The Henry Jackson Waters Loan Fund. The Henry Jackson Waters loan fund consists of the royalties received from the Kansas sales of Ex-President Waters' textbook, *The Essentials of Agriculture,* for the first five years. The royalties have amounted to approximately $2,000, which sum has been augmented by gifts of $100 each from Senator Capper and L. R. Eakin, of Manhattan, and by smaller amounts received from some others. The entire amount, now over $3,000, is in constant use. The fund is administered by a committee appointed by the president of the College and approved by the Board of Regents. The rules for the loans are likewise approved by the Board. The rules allow emergency loans of $50 to any student who has completed one semester of work in this College. Juniors may borrow $100 and seniors may borrow $150. Applications for loans should be made to Prof. Albert Dickens, chairman of the Waters Loan Fund Committee, Manhattan, Kan.

The Chamber of Commerce Loan Fund. The members of the Chamber of Commerce of Manhattan have raised a fund which now amounts to $3,000 and is being augmented constantly. This is loaned to deserving students at 5 per cent per annum. About ninety loans have been made. Applications for loans from this fund should be addressed to the secretary, Chamber of Commerce, Manhattan, Kan.

The State Federation of Women's Clubs Loan Fund. Each year several of the young women students of the Kansas State Agricultural College are beneficiaries of the State Federation of Women's Clubs through the administration of its liberal Young Women's Student Loan Fund. Information regarding this fund can be obtained by addressing Dean Mary P. Van Zile, Manhattan, Kan.

The P. E. O. Loan Fund. The P. E. O., a national organization of women, maintains an education fund to be loaned to girls to help defray college expenses. Information regarding this fund may be obtained from Dean Mary P. Van Zile.

The Social Club Loan Fund. This is a fund loaned by the K. S. A. C. Social Club and is administered by the Waters Loan Fund Committee.

The D. A. R. Loan Fund. The D. A. R. loan fund is a fund available to both men and women students and is administered by the Waters Loan Fund Committee.

The Women's Pan-Hellenic Loan Fund. The Alumnæ Pan-Hellenic Fund is loaned to women students. Applications should be made to the president, City Pan-Hellenic, through Dean Mary P. Van Zile.

The Woman's Club Loan Fund. This is a fund established by the Woman's Club of Manhattan, and is available to both men and women students. This loan is administered by the Waters Loan Fund Committee.

The Belle Selby Curtice Loan Fund. Mrs. Belle Selby Curtice, a graduate of the class of 1882, established a loan fund of $1,000 in memory of the influence and inspiration the College has given her life. This fund is available to young women in the curriculum in Home Economics and is administered by the Henry Jackson Waters Loan Fund Committee.

Masonic Loan Funds. The Scottish Rite Consistory and the Knights Templar Commandery have established loan funds that are available for men and women who have given evidence of scholarship and worth. Applicants should seek recommendations from the consistory and commandery with whose members they may be acquainted.

PRIZES AND MEDALS

Stock Judging. The Block and Bridle Club offers four medals, one gold, one silver, and two bronze, to students obtaining the highest four places in the club's stock-judging contest. The same organization offers prizes of books for stock judging. The faculty of the Department of Animal Husbandry offers prizes of books or papers on stock judging.

Dairy Judging. The Student Dairy Association each year holds a dairy-judging contest, and offers a gold, a silver, and a bronze medal to students obtaining the highest three places.

Poultry Judging. The Department of Poultry Husbandry offers prizes to the value of $150 to students in poultry-judging contests.

Grain Judging. The Klod and Kernel Klub holds an annual grain-judging contest. Cash prizes, subscriptions to farm papers, and ribbons are given to the highest ranking students.

Agricultural Engineering. The Agricultural Engineering faculty offers annually to the senior agricultural engineering student having the highest scholarship standing in his junior and senior subjects a cash prize of $25.

Architecture. The American Institute of Architects offers a medal to the senior architect showing the highest degree of general excellence. The faculty of the Department of Architecture offers prizes of books to those freshmen, sophomores, and juniors who do the best work. Lorentz Schmidt offers a cash prize to the student doing the best work in courses in working drawings and specifications.

Civil Engineering. The Kansas section of the American Society of Civil Engineers offers payment of the initiation fee into the American Society of Civil Engineers to the senior civil engineer making the highest grades during his senior year.

Electrical Engineering. Two gold medals, first and second, are awarded those seniors who have made the best records in twenty hours of certain fundamental, required electrical engineering subjects. Also, two gold medals, first and second, are awarded to the ranking juniors who have completed not less than eighty semester credits of the required electrical engineering curriculum.

Play Writing. The Purple Masque Dramatic Fraternity offers each year a prize of $50 for the best original play written by a student of the Kansas State Agricultural College and suitable for presentation by the fraternity.

Scholarship. Freshman women. Phi Alpha Mu, the women's honor society of the division of general science, offers each year a prize of $20 to the young woman making the highest scholarship standing in the freshman work. Omicron Nu, the honor society of the division of home economics, grants annually a prize of $10 to the young woman achieving highest rank in scholarship among the freshmen of that division.

Short-story Writing. The Quill Club offers annually a gold medal to the student of Kansas State Agricultural College writing the best short story in a contest held by this organization.

Journalism. The United Companies offer two prizes of $25 each for students in advertising who write the best copy. Professors Brown and Rogers offer $25 annually for the best rural press team. *Wheat Growers Journal* and the Kansas Grain Dealers Association offer cash prizes for writing.

Oratory. The literary societies, through the Oratorical Board, offer each year, in the Intersociety Oratorical Contest, the following prizes:

First prize, gold medal and $25.
Second prize, silver medal and $15.
Third prize, bronze medal and $10.

The Oratorical Board also finances the sending of a representative from the College to the annual Peace Oratorical Contests, to the winners of which valuable prizes in money are awarded.

The Department of Public Speaking sends to the annual Missouri Valley Contest an orator as the representative of the College. In this contest valuable prizes in money and medals are awarded.

Sociology. The Kappa Alpha Chapter of Chi Omega Sorority offers a prize of $25 to the student who holds the highest grade in sociology at the end of the second semester each year, the standing of the student to be determined by the instructor.

Veterinary Medicine. Dr. Edward A. Schmocker offers two prizes of $10 and $5 respectively to the senior veterinarians showing the greatest general proficiency. The Jensen Salsbery Laboratories of Kansas City, Mo., offers two prizes of $10 and $5 respectively to junior veterinarians having the highest standing in therapeutics. The veterinary staff offer $7.50 to the sophomore ranking highest in physiology, and $7.50 to the senior ranking highest in pathology.

SCHOLARSHIPS

The Manhattan branch of the American Association of University Women offers a graduate fellowship, a gift, of $200 annually. Work may be pursued in any department of the College recognized by the Graduate Council. Applications must be in the hands of the scholarship committee on or before March 1 previous to the academic year in which the scholarship is desired.

Debate. In the Department of Public Speaking two scholarships of the value of $100 each, one for men and one for women students, are offered annually for proficiency in intercollegiate debating.

For High-school Students. The Department of Education offers scholarships to high school students as follows: $100 for the best score in the annual scholarship contests, $75 for the second best score, $50 for the third best score, and $25 each to individuals scoring fourth, fifth, and sixth highest respectively.

For 4-H Club Members. The Union Pacific System offers $100 scholarships to winners in 4-H Club work (in 36 counties named), the money to be used to enroll for a full term course in agriculture or home economics.

GRADUATE ASSISTANTSHIPS

Graduate assistantships have been established for some years by action of the Board of Regents, and are available in several departments of the College. For full details see a previous paragraph in the section devoted to graduate study.

BUSINESS DIRECTIONS

General information concerning the College may be obtained from the president or the registrar. Financial matters are handled through the office of the business manager, State Board of Regents, Topeka, Kan.

Prospective students desiring information or catalogues should address the vice president's office.

Scientific and practical questions, and requests for special advice in subjects in which the College and the Experiment Stations are prepared to give information, should be addressed to the heads of the departments concerned with the work regarding which information is sought.

Applications for farmers' institutes should be made as early in the season as possible, to the Division of Extension. Applications for the publications of the Agricultural Experiment Station should be addressed: Director of the Agricultural Experiment Station, Manhattan, Kan. Publications of the Engineering Experiment Station may be had by addressing: Director of the Engineering Experiment Station, Manhattan, Kan.

Donations to the Library should be addressed to the librarian, and donations to the Museum to the curator of the Museum.

STUDENT ASSEMBLY

The Student Assembly is held one hour each week. The library, offices, classrooms, and laboratories are closed and the students gather in the College Auditorium. These assembly exercises consist of devotional services, music, and addresses. The devotional exercises are conducted by members of the Faculty, by resident ministers of the various denominations, or by prominent visitors. Excellent music is provided by the College Orchestra, by members of the Department of Music, and by available outside talent. In addition to the addresses delivered by the president and by members of the Faculty, many prominent leaders of state and national reputation are invited to address the assembly. Thus the Student Assembly has become a center of true culture and enlightenment. Although attendance is not compulsory it is common to see nearly two thousand students present during these exercises.

COLLEGE PUBLICATIONS

The official organ of the College is *The Kansas Industrialist,* published and printed at the College weekly by the Department of Industrial Journalism and Printing. Its pages are filled with articles of interest, with special reference to agriculture and the industries. Particular attention is paid to information concerning the work of the College, to investigations of the Experiment Stations, and to local and alumni news. *The Kansas Industrialist* will be sent to any address for $3 a year. The alumni having active membership in the Alumni Association receive *The Kansas Industrialist* free of charge.

The Division of College Extension issues a monthly publication entitled *Agricultural Education,* of special interest to institute members.

The students of the College publish a semiweekly periodical, *The Kansas State Collegian,* in the interest of the students at large. A humorous magazine, *The Brown Bull,* is published by the students and appears about four times during the college year. *The Kansas State Engineer* is published by students in the Division of Engineering. Students in the Division of Agriculture issue *The Kansas Agricultural Student. The Home Economics News* is published quarterly by the faculty and students of the Division of Home Economics. A College annual, *Royal Purple,* is published each year by the senior class.

COLLEGE POST OFFICE

The College operates an office for the reception and delivery of mail. This is not a part of the United States postal service, but students and College officers may have their mail delivered there. Mail is received from the Manhattan post office and taken to it three times a day. Matter may be deposited for registered mail, and postage stamps may be procured, but post office orders cannot be obtained.

The chief purpose of this office is to facilitate intercommunication of College departments and communication of deans and teachers with students. All students are expected to call for their mail at least once each two days and preferably every day.

ASSIGNMENTS

No student may be enrolled in classes or for private lessons in music or other subjects before receiving an assignment, and no assignment is completed until after the incidental fee and any special fees or charges are paid.

Assignments at the dates shown in the College calendar are made in Nichols Gymnasium, where detailed directions are announced by placards. Later assignments are made by the student's assigner during regular office hours, but are subject to checking by the registrar in respect to availability of classes. Classes are closed when the limits as to numbers are reached. A student is not admitted later than ten days after the opening of the semester except by special permission of his dean. An extra fee of five dollars is charged for assignments secured after the regular dates for assignment of students at the opening of each semester as announced in the College calendar.

A student desiring to take work at any other than the regular time must obtain the written consent of his dean, the head of the department in which the work is to be done, and the dean of the division to which the department belongs.

Each student must take full work unless excused by his dean, and more than regular work is not allowed to any student except by permission of his dean, and under no circumstances to anyone who failed or was conditioned or deficient in any subject the preceding semester, or whose average grade was below G.

A student is not allowed to carry work by correspondence while enrolled here, except by permission of his dean.

Special requests concerning assignments, and permission to make up deficiencies by outside study under an approved tutor, are acted upon by the student's dean in conference with the heads of the departments involved.

SCHOLARSHIP DEFICIENCIES

Any freshman student who receives deficiencies (grades below passing) in one-third of the work to which he is assigned, or any other student who receives deficiencies in one-fourth of his work, at the end of the semester, is automatically placed on probation for one semester and the parent or guardian of the student is informed of the fact. A third such probation automatically includes dismissal from the College.

Any freshman student who receives deficiencies in one-half of his work, or any other student who receives deficiencies in two-fifths of his work, at the end of the semester, is automatically dismissed from the College.

Dismissal for scholarship deficiencies continues for one semester and one summer school period. During this time the student must not habitually appear upon the campus nor enter any classes. Any student dismissed for scholarship deficiencies may petition in writing, on a form provided by the College, for immediate reinstatement. Petitions presented by such students are considered by a committee appointed for that purpose. Reinstatement is granted only in exceptional and meritorious cases.

CHANGES IN ASSIGNMENTS

Subjects are not dropped from assignments within two weeks preceding the close of a period covered by midsemester or final scholarship-deficiency reports.

No student may drop a study or modify his assignment except by a reassignment, and any student desiring a change in his assignment must apply to his dean. Any change in a student's assignment is made in the office of his dean. Teachers desiring that assignments be changed send requests to the proper deans. Notices of changes are furnished the registrar, the student, and the student's assigner. Changes are effective at once, and the registrar, through the heads of departments, sends notices or enrollment cards to the teachers affected.

A student receiving a notice of reassignment must at once report to classes in accordance therewith. If not content with the revised assignment, he may confer with his dean concerning it. All absences caused by a student's dropping out of class without a proper reassignment are reported by the instructor as unexcused absences.

ABSENCE AND TARDINESS

Each student must appear at the first exercises of his classes after he is assigned. Students must be present the very first day of each semester or render a reasonable excuse. All absences are reported from the first day of the semester, even though the student enrolled late. Failure to take out an assignment is not accepted as an excuse for absence from classes. A student is not admitted later than ten days after the opening of the semester except by special permission of his dean.

Each student is required to attend exery exercise of a class to which he is assigned. All absences and all cases of tardiness must be promptly accounted for on the "absence blanks." Permission for necessary absences from College for a day or more must, in all cases, be previously obtained from the dean. Any student present at College and desiring to be excused for the day from certain classes must apply in advance to the teachers of those subjects.

The student's attendance record is considered by each instructor as an important factor in determining the grade given in a subject.

The class record of attendance is marked immediately after the beginning of the class period. For students who come in late the record of absence may be changed to that of tardiness, but the teacher is not obliged to make such change unless the student on the day of tardiness hands to him at the close of the hour, on the "absence blank," a statement that he was present. In such a case the record is changed to agree with the facts. When a student who has been absent from College because of sickness returns, he must present to each instructor a certificate of good health from the College physician before he is permitted to remain in any classroom. The aim is to prevent the spread of any contagious disease.

Any class is excused if for any reason the instructor fails to report at the end of ten minutes after the beginning of the recitation period, unless the instructor sends word that he will be there later.

Signed reports of absences for each day are sent to the deans by the teachers before five o'clock p. m. Excuses submitted by students are transmitted with a recommendation in respect to excusing the absence. Action concerning excuse for absence is taken by the student's dean. Excuse for an absence does

not relieve the student from responsibility for lecture, recitation or laboratory work lost while absent.

Any student who is found to be persistently inattentive in his College work is at once temporarily suspended by his dean, and reported to the president for permanent suspension.

EXAMINATIONS

Examinations are held during the last eight days of the semester in accordance with a definite examination schedule which, as far as possible, gives the student not more than two examinations on any one day.

No regular examination may be given at a date in advance of that provided, except that, at the discretion of the head of the department, a student may be permitted to take his examination with another class in the same subject instead of in his own class, and that in cases of extreme importance the dean of the student may authorize an examination at an earlier date.

Any student who receives a grade of E for the semester, in any subject, and whose absences for all causes from the class in each subject do not exceed one-tenth of the number of times the class is scheduled to meet during the semester, may be excused from the final examination in that subject, at the discretion of the instructor; provided, however, that instructors are to announce such exemption lists in their respective subjects not earlier than the last session of the class preceding the final examination.

Examinations to remove conditions are held on the fourth Saturday of each semester. A student who has received the grade of C is entitled to take such special examination, provided the instructor or the department head be notified of the student's desire to take the examination not later than the Tuesday evening preceding the Saturday set for the examinations. If a subject in which a student is conditioned is not passed at the first opportunity, the grade is changed from C to F, except that in individual instances, where the reason is sufficient, the student's dean may authorize such examination at a date different from that provided by the rule.

Permission for examination in subjects not taken in class or to make up failures by special examination must be obtained on recommendation of the professor in charge, from the dean of the division in which the student is assigned. Permission to take such examination is not granted unless the preparation for it is made under an approved tutor. All such examinations are under the immediate supervision of the professor in whose department the subject falls.

Examinations in high-school subjects for admission to the College are held at the beginning of each semester and of the summer school. Students desiring such examinations should consult the registrar in advance.

GRADES

Student grades are designated by the letters E, G, M, P, C, F, and U, having the following significance and order of rank:

The grade E designates really distinguished achievement, and is the net resultant of exceptionally good mental ability in conjunction with serious application. It is expected that this grade will not include more than ten per cent of all grades given a class, and usually will include about five per cent.

The grade G represents superior achievement, better than that exhibited by the average student, but not distinguished. It is recognized as a mark of considerable honor and is the resultant of high ability and fair application, or of fair ability and serious application. The percentage of students assigned this grade will depend somewhat upon the number assigned grade E, but the sum of grades E and G should approximate twenty-five per cent of all grades assigned.

The grade M represents the standing of about half of all students in the College. It means achievement equal to that of the average of students, and includes about half of all student grades. It indicates neither superior nor inferior accomplishment.

The grade P, meaning passed, represents achievement of a grade below that of the average of students. It indicates a student's position as being in the upper part of the lower fourth of the class, and his work as being such as may be described as poor, or inferior. The number of grades P awarded, together with the grades C and F, should not, on the whole, exceed twenty-five per cent of all, and are expected to include about that proportion.

The grade C, meaning conditioned, is the symbol used to represent two types of inferior work: (*a*) that which is deficient in quality, and (*b*) that which is satisfactory as to quality but inadequate as to quantity. The results of examinations to remove conditions are reported simply as P (passed) or F (failed), and such examinations not taken are recorded as F. Conditions given because of insufficient work may be made up at any time previous to the fourth Saturday of the next semester that the student is in attendance.

The grade F, meaning failed, is used to indicate work that is so unsatisfactory as to require that the work be repeated in class or under an approved tutor.

The letter U, meaning unfinished, is reported when, in the judgment of the instructor, the student deserves further time to complete work which has been interfered with by illness or other excusable cause of absence or disability. This is only a temporary report and in no way prejudices the student's final grade in a course. It is expected that such unfinished work will be completed within one month after the student returns to College.

The distribution of grades indicated above applies to large numbers, at least a hundred or several hundred, and is not necessarily true of small numbers. It is not a foregone conclusion, for example, that one in a class of twenty must fail nor even that one in the class must have an E grade. In a small group the chances are very much greater that there may be a departure from the normal. If there be such a departure it should of course be recognized in the grades issued. In the long run the accumulated grades for a series of small classes should, however, approach the normal distribution.

REPORTS OF GRADES

On the fifth Saturday and the ninth Saturday of each semester, on the last day of the first semester, and within two days after the close of the second semester, reports of all grades below passing at those dates are sent to the students and the deans. The dates are shown in the College calendar, and these reports are an imperative duty of all teachers. The first two of these reports are made in percentages on a scale of seventy for passing. The reports at the end of the semester are on the letter system in use.

The instructor prepares for each student a semester grade based on the examination and class work, and is required to report this to the registrar for record within two weeks after the close of the semester. If a student goes through the first half of the semester, but not the second half, a half-semester grade is reported for record, and designated as such. If the student drops out of College before midsemester a grade of Wd (withdrawn) is reported for each subject, irrespective of the standing of the student in the subject. Similarly, if a student drops a subject before midsemester a grade of Wd is reported. However, subjects are not dropped from assignments within two weeks preceding the close of a period covered by midsemester or final scholarship-deficiency reports. A subject dropped at any time after midsemester on account of failure is given a semester grade of F.

The result of an examination to remove a condition is reported in quadruplicate to the dean of the student, who transmits copies to the registrar, the student and the student's assigner. The same procedure is followed in reporting grades to replace "U's" and in reporting corrections of grades.

In case of absence from the final examination at the end of a semester, a semester grade is not reported until the reason for such absence has been learned; and if the absence is excused or excusable, a reasonable time, usually not over one month, is allowed within which the examination may be taken. In such cases, however, within two weeks after the end of the semester the teacher reports to the registrar a mark of U with a grade for the first half of

the semester. If the student's absence is inexcusable a semester grade is reported on the basis of zero for the final examination.

Students in laboratory and industrial work must put in at least four-fifths of the required time in order to get a passing grade in the subject. Should the required time minimum not be reached a mark of U is reported if the quality of the work done is satisfactory and one of F if it is unsatisfactory.

Instructors are enjoined to leave all class books on file in the proper department or with the president of the College when severing their connection with the institution.

THE POINT SYSTEM

For each semester credit of work assigned, the student receives points, according to the grade attained, on the following scheme: Grade E, 3 points; G, 2 points; M, 1 point; and P (or lower), no points. For graduation the total requirement in points is the same as in credits. Above the freshman year classification is based on the same requirement in points as in credits.

Seniors meeting the graduation requirement in credits but failing to meet it in points are required to take further courses designated by the dean of the division in which their major work lies, until the requirement in points is met.

CREDITS FOR EXTRA WORK

Activities connected with the College, but not provided for by any of the curricula, either as required subjects or as electives, are designated as *extra subjects*.

Credit for extra work may be given when the student is regularly assigned to the work in accordance with the general rules governing assignments. A student may be assigned to extra work for credit upon the written recommendation of the instructor in charge of the work. This recommendation is filed in the office of the student's dean, and is effective until revoked.

Credits earned for extra work may be counted as part or all of the electives in any of the College curricula. In curricula that do not include electives, credits for extra work are available only as substitutions for required work, and must be approved in the regular way before becoming effective. A total of not more than eight semester credits may be allowed a student for extra work, and not more than two of these may be obtained in any one semester.

The number of semester credits that may be allowed for extra work is as follows:

Subject.	*Per semester.*	*Total.*
Orchestra	1	4
Band	1	4
Debate	2	4
Oratorical Contest	2	4
Kansas State Collegian journalism	1	4
Home Economics News journalism	1	4
Agricultural Student journalism	1	4
Kansas State Engineer journalism	1	4

BIBLE STUDY

Bible study is an elective. Two semester credits are granted for each completed one-year course. Credit may be granted to any one student for not more than two courses. Teachers of classes are to be approved as tutors, and the supervision of the work is placed in the Department of Education. This department also conducts the examination for credit in Bible study.

COURSE NUMBERS

Each course offered bears a number indicating in a general way the standing of students for whom it is given. Courses for undergraduates bear numbers 101 to 199, courses for undergraduates and graduates bear numbers 201 to 299, and courses for graduates only bear numbers 301 to 399. The numbers 1 to 29 are applied to studies offered for short-course students, the numbers 31 to 49 are assigned to Summer School subjects not taught for entrance credit or for

College credit, and subjects which give credit for admission to the College are numbered 51 to 99.

In applying this system, the courses offered by any department are numbered independently of all other departments of the College.

CLASSES

The minimum numbers for which classes are organized are as follows:

Freshmen or sophomores	12
Juniors or seniors	7

This rule is varied only by special permission of the Board of Regents.

THE STUDENT GOVERNING ASSOCIATION

The governing association of the student body was organized in the spring of 1919, as the Student Self-governing Association, and reorganized in the spring of 1926 as the Student Governing Association.

The executive council of the association consists of seven members, elected each spring for the following school year by the student body as a whole. The council discharges all executive functions of the association, and sits as a court in disciplinary cases. Actions of the council are subject to approval by the faculty council. In cases of disagreement which are not compromised successfully, the decision of the president of the college is final.

Officers of the association are a president, vice president, secretary, and treasurer, elected by the council. Though the council sits as a committee of the whole in all its affairs, certain members are put in charge of certain activities, such as discipline, social affairs, etc. Membership in the student association is contingent upon payment of the varsity activity fee.

THE CHRISTIAN ASSOCIATIONS

The Young Men's Christian Association and the Young Women's Christian Association are organizations of the greatest worth and value in the College community, forming centers of moral culture and religious stimulus among the young men and women during their development period. As is well known, the Christian associations in colleges stand for the best ideals among the students, and are always accorded the cordial support of the authorities. In addition to general moral and spiritual development, the college Christian associations have a practical and efficient influence among the students in many directions.

THE YOUNG MEN'S CHRISTIAN ASSOCIATION

The College Y. M. C. A. has always been a strong and influential body among the students. All young men of the College are welcomed into membership of the organization. No fixed fee is charged, each member giving whatever he feels able to afford. The work of the organization is carried on by a student cabinet, which is composed of the chairmen of the standing committees and officers. Each year there is organized a freshman commission for the benefit of the new men, especially those who have had Hi-Y experience. One of the useful and practical features of the Y. M. C. A. is the student's employment bureau, which is maintained for all students seeking employment. Especial attention is given the new students on and after arrival in helping them to find rooms and boarding places and to get the right start in College life. The association maintains a regular secretary, with whom prospective students are cordially encouraged to correspond. Address, General Secretary Y. M. C. A., Kansas State Agricultural College, Manhattan, Kan.

THE YOUNG WOMEN'S CHRISTIAN ASSOCIATION

Similar in aim and purpose to the organization of the young men is the Young Women's Christian Association. Calvin Hall is the headquarters of the Association, to which all young women of the College are at all times

cordially welcome. An office for the general secretary and rest rooms for the young women are maintained in this building during the College year.

An employment bureau for women students is maintained by the general secretary, without charge to its beneficiaries. Various committees are responsible for the lines of work of the association. At the opening of the College semesters the incoming trains are met by "Big Sisters," who assist new women students, the "Little Sisters," in securing suitable lodging and boarding places. If any prospective woman student will write to the general secretary of the association, her "Big Sister" will correspond with her during the summer vacation.

During the College year various social functions are given for the young women. The first of these is an informal reception to enable the College girls to become acquainted with one another. Once each year the two associations entertain jointly.

The religious life of the young women is fostered by the weekly vesper services held in Recreation Center. The different churches of the city extend a cordial welcome to the College women, and through the efforts of the association they are encouraged to active participation in the services of the church of their choice.

THE NEWMAN CLUB

The Newman Club, an organization of Catholic students, holds meetings devoted to religious study on alternate Sundays. This work is carried on under the local pastor. The College authorities recognize this Bible study by allowing a two-hour credit for it when duly certified. In further recognition of the club's efforts the College has placed a set of the Catholic Encyclopedia in the library, where there is also a comprehensive selection of Catholic books and pamphlets purchased by the club. In addition to the meetings devoted to religious study, social meetings are held.

The club is affiliated with the national organization of Newman clubs of the state universities and colleges. Its aim is to foster sound morality, to develop character, and to promote the knowledge and practice of their faith among Catholic students.

LITERARY AND SCIENTIFIC SOCIETIES

The literary societies of the College, eight in number, are wholly student organizations, holding weekly meetings in the College buildings. The Alpha Beta and Franklin literary societies are open to both sexes; the Ionian, Eurodelphian and Browning societies admit only young women to membership; the Webster, Hamilton and Athenian societies admit young men only. Students are encouraged to join one of these organizations for the sake of practice in the use of language, training in debate, and general experience in conducting meetings and in dealing with their fellows. These societies jointly maintain a debating council, which coöperates with a faculty committee in arranging for all intercollegiate and interstate debates participated in by representatives of the College. The oratorical board, similarly maintained by these societies, arranges for the intersociety oratorical contest.

SCIENCE CLUB

The Science Club, meeting monthly, is an organization of instructors, students and others interested in science. Its programs include popular lectures by prominent men of science, and papers giving the results of research work at the College. The meetings are also characterized by free discussion of the subjects presented.

AGRICULTURAL SOCIETIES

The Agricultural Association meets Monday evenings. All students interested in agriculture are eligible to membership. The object of the association is to promote the general interests of agriculture in the College and in the state.

The Agricultural Economics Club meets on the second and fourth Tuesdays of each month. Membership is open to undergraduate students majoring in agricultural economics, graduate students majoring or minoring in agricultural economics, and to members of the faculty whose work is of an agricultural economic character. The object of the club is to promote interest in agricultural economic topics, to encourage sound economic thinking, and to further the acquaintanceship of faculty and students. Outside speakers are frequently secured for special meetings which are open to the public.

The Block and Bridle Club meets on the first and third Mondays of each month. Membership is open to all animal husbandry students above the freshman year. The object of the club is to promote the interest of animal husbandry in the College and in the state. Live-stock problems of all kinds are taken up, and the members of the faculty and outside speakers are secured for addresses on special topics.

The Dairy Club meets on the first and third Mondays of each month. Membership is open to anyone who is taking any four-year curriculum in the Division of Agriculture and also to anyone actively engaged in dairy work at the College. The object of the organization is the furtherance of dairying in Kansas. Current topics and records of the dairy breeds are read and lectures on special subjects are given by faculty and outside speakers.

The Horticultural Club meets the first and third Tuesdays of each month during the College year. Its object is to promote the horticultural interests of the state and to afford opportunity for students to improve their knowledge of horticulture. Students of the College interested in horticulture and faculty members are eligible for membership. Students present the majority of the programs.

The Klod and Kernel Klub meets on the second and fourth Tuesdays of each month. Membership is open to junior and senior agronomy students and members of the agronomy faculty. The object of the society is to arouse more interest in agronomic work and to help students and faculty members of the Department of Agronomy to become better acquainted. Faculty and outside speakers are secured for programs.

ENGINEERING SOCIETIES

The students in agricultural, civil, electrical, and mechanical engineering are organized as student branches of The American Society of Agricultural Engineers, The American Society of Civil Engineers, The American Institute of Electrical Engineers, and The American Society of Mechanical Engineers, respectively. The Architects Club conducts the meetings of the students in architecture.

The purpose of these various societies is to acquaint the students with the latest development in the fields of engineering and architecture, to give them more definite ideas as to the opportunities in their professions and the requirements for success in their professions, to promote acquaintance and fellowship among the students, and to further the interest of the Division of Engineering in the College and the state.

HOME ECONOMICS SOCIETIES

The Home Economics Association is an organization in which membership is open to any student in the Division of Home Economics.

Its purpose is to promote professional interest by means of social contact and through talks by leaders in the field of home economics. It aids in the publication of the *Home Economics News,* the divisional magazine issued four times a year. It is affiliated with the American Home Economics Association and is designed to lead to continued membership in that organization after graduation from college.

HONORS

In each of the divisions of the College "sophomore honors" are awarded at Commencement to not more than five per cent of the sophomore class having the highest standing up to the close of the sophomore year.

In a similar manner "senior honors" are awarded to not exceeding ten per cent of the senior class having the highest standing during their junior and senior years.

In awarding honors, the following values are assigned: Grade E, 3; G, 2; M, 1; P, 0; C, minus 1; and F, minus 2. The honor grade is found by dividing the sum of the products of the grade values and the credit hours by the number of credit hours of work taken. In order to receive honors, the student's average must be G or higher.

The diplomas of the highest three per cent of the senior class are inscribed "with high honor" and of the remainder of the highest ten per cent "with honor."

HONOR SOCIETIES

A chapter of Phi Kappa Phi, an honor scholarship society, membership in which is open to honor graduates of all departments of American universities and colleges, was installed at the Kansas State Agricultural College on November 15, 1915. The eligibility of undergraduates to membership is determined on the basis of their scholarship. The candidates are elected to membership at the October, April and July meetings of the chapter.

The honor society of agriculture, Gamma Sigma Delta, has as its object the encouragement of high standards of scholarship in all branches of agricultural science and education, and the encouragement of a high degree of excellence in the practice of agricultural pursuits. Seniors whose grades place them in the upper one-fourth of their class are eligible for membership. Election is in the hands of faculty members of the local chapter.

Besides these, above mentioned, there are a number of honor fraternities, sororities, and societies which are open to students in different divisions of the College or in different activities. These are treated below.

HONORARY AND PROFESSIONAL ORGANIZATIONS

The honorary and professional organizations of the College consist of fraternities, sororities, and societies. Membership in these organizations is based on scholarship and achievement. They seek to stimulate effort and to promote the interests of the various divisions or departments which they serve or represent. The list of organizations follows:

Organization.	*Division or department.*
Alpha Zeta	Agriculture.
K Fraternity	Athletics.
Mu Phi Epsilon	Music.
Omicron Nu	Home Economics.
Phi Alpha Mu	Women's Science.
Phi Delta Kappa	Education.
Phi Mu Alpha	Music.
Pi Kappa Delta	Debating.
Purple Masque	Dramatics.
Quill Club	College Writers.
Scabbard and Blade	Military.
Sigma Delta Chi	Industrial Journalism.
Sigma Tau	Engineering.
Theta Sigma Phi	Industrial Journalism.

In addition to these student organizations there are chapters of Phi Kappa Phi, Gamma Sigma Delta and Sigma Xi. In these societies election is based on scholarship and is in the hands of Faculty members. (See "Honor Societies," above.)

THE COLLEGE BAND

The College Band is a military organization, composed of cadets assigned to this duty for the College year in lieu of drill and technical military instruction. The Band is limited in its membership, and attendance of the members upon its exercises is obligatory. It has proved an effective aid to the cadet corps, stimulating a love for martial music, and affording an attractive feature of the various public ceremonial occasions at the College.

THE COLLEGE ORCHESTRA

The Orchestra is a student organization connected with the Department of Music, membership in which is voluntary. Its daily training under competent leadership results in the acquisition of a considerable repertoire of musical compositions of the best quality. Those connected with the Orchestra obtain in this way familiarity with the works of many of the great composers, and among the students at large the Orchestra is an efficient aid in cultivating a taste for an appreciation of good music.

ATHLETIC ORGANIZATIONS

By means of the gymnasium the College is prepared to give complete physical as well as mental training. This building, which is equipped with all the usual accessories, assists in developing and maintaining physical tone and health in the student body. In addition to the gymnasium classes, and physical training in the military corps of cadets, all young men are encouraged to develop their physical skill by playing on practice teams in various athletic lines. In the fall football teams are organized; in the fall and winter, basket ball; while in the spring baseball, tennis, and track athletics prevail. Every possible encouragement is given all students desirous of participating in these games to enter the practice teams and receive the necessary instruction. The most proficient of these have opportunity to enter the first teams and participate in intercollegiate contests. The College authorities encourage all reasonable and sane athletic development, as a means for the training of physical qualities desirable in men everywhere. Professionalizing tendencies are strictly repressed, and the athletic rules adopted by the Faculty prevent, by proper regulation, all participation in intercollegiate games on the part of students deficient in their studies.

The women students have equal opportunity with young men for general physical training. In the gymnasium, under a physical director, they receive training suitable for their needs. Basket ball and tennis teams are organized among the young women.

The Division of Agriculture

Leland Everett Call, *Dean*

The teaching of rational, practical agriculture is fundamental to development in a state whose principal industries are agricultural. Kansas prospers in direct proportion to the productivity of her soil and to the effectiveness with which it is utilized. Effective utilization of the agricultural resources of the state depends upon the success with which the agricultural industries of the state are developed. In order to succeed in farming it is necessary to know something of the soil, the conservation of its fertility and moisture, and its proper cultivation; the kinds of plants to grow and how to improve them; the selection, breeding, and feeding of live stock; the maintenance of orchards, gardens, and attractive surroundings; farm buildings, and the equipment of the farm and the farm house with modern conveniences; the best methods of marketing the product of the farm; and in addition to all this, how to make the farm home the center of influence for good citizenship in the agricultural community.

A man may learn many of these things through practical experience, and thus become successful in modern farming. But practical experience alone is slow and expensive. The Kansas State Agricultural College furnishes a means of acquiring systematic training in agriculture which fits young men adequately for the farm and at a moderate expenditure of time and money.

In addition to training men for service as farmers, the College prepares students for various other activities which must be carried on if the agriculture of the state and nation is to be developed properly. These activities include scientific investigation of agricultural problems in state and national institutions, agricultural extension work, teaching of agriculture, service in the industries directly involving agriculture, and a variety of other lines of public and private service of an agricultural nature. The demand for well-trained, reliable men in all these lines is always extensive. The primary aim of the College in training men in agriculture is to fit them for service in which they will develop into agricultural leaders, either as farmers or in some other capacity, and as such, contribute to the upbuilding of rural institutions and the improvement of American country life.

EQUIPMENT

The facilities for such training at this College are of a high order. The College owns 1,420.3 acres of land, which is used for investigation, instruction, and demonstration in the various courses in agriculture and allied branches. The campus, which comprises 160 acres, is one of the best examples of ornamental tree planting and forestry in the state. Students working daily amid such surroundings can scarcely fail to gain an appreciation or love for the beautiful. A tract of 320 acres is devoted to the work in agronomy; for horticulture and forestry work, 80 acres are used; for dairy work, about 160 acres; and for animal husbandry, about 550 acres. The herds and flocks contain high-class representatives of the important breeds of dairy and beef cattle, hogs, horses, and sheep. With this class of stock available for the work in judging, the student is supplied with types of the best breeds and becomes familiar with these types by actual handling of the stock.

CURRICULA IN AGRICULTURE

The various needs of the student of agriculture are met by the following curricula:

A four-year curriculum in agriculture.

A four-year curriculum in agricultural administration.

A four-year curriculum in agriculture with special training for landscape gardening.

A six-year curriculum in animal husbandry and veterinary medicine.

Various special courses. (The work of these courses is discussed in another section of the catalogue.)

DEGREES

The four-year curricula in agriculture lead to the degree of Bachelor of Science (in agriculture).

The six-year curriculum in animal husbandry and veterinary medicine, the last two years of which are given in the Division of Veterinary Medicine, leads to the degree of Bachelor of Science at the end of four years, and to the degree of Doctor of Veterinary Medicine at the end of two more years.

CHOOSING A CURRICULUM

All curricula in the Division of Agriculture have a common freshman year. During the second semester of the freshman year, each student in the division is required to file in the dean's office a formal statement of his selection of a curriculum.

During the second semester of the sophomore year each student is required to file in the dean's office a formal statement of his selection of a department in which he will major. All electives must be approved by both the head of the department in which the student majors and the dean of the Division of Agriculture.

THE CURRICULUM IN AGRICULTURE

The four-year curriculum in agriculture is designed primarily to meet the needs of the students who expect to return to the farm. However, the student who completes the curriculum will have had sufficient training to enable him to enter some one of the many lines of agricultural industry as a specialist. The demand for men thus trained is constantly increasing, and such positions offer attractive opportunity for men who by nature and training are adapted to the work. The United States Department of Agriculture, the state colleges and departments of agriculture, high schools, private institutions of secondary and college rank, and a great variety of commercial interests, are constantly demanding men trained in agriculture.

The young man who expects to make farming his life work can start with no better asset that the thorough training in practical and scientific agriculture afforded by the four-year curriculum. The American farmer needs more of the skill that comes through the training of the hand, in order that he may better do the work of farming; but much more, he needs the training of the mind in the fundamental truths that underlie every operation in farming, in order that he may use the skill of the craftsman with reason and judgment. One may learn to plow a field with the greatest skill; the work may be a model of its kind. If, however, it is plowed with utter disregard of the moisture conditions which prevail the result may be a failure. To understand the conditions which should determine when and how to plow is the work of the trained mind; the other is the work of the trained hand. The farmer and the teacher of agriculture must possess both kinds of training, and the curriculum has been organized with this fact in view, and has been so arranged that the *student begins his practical training in agriculture on the first day he enters College.*

ANALYSIS OF THE CURRICULUM IN AGRICULTURE.

One hundred twenty-four semester credits in addition to military science are required for graduation, as follows:

	Semester credits.	
Prescribed in agriculture	31	
Electives in agriculture, required with the prerequisites	21	
Required in agricluture		52
Prescribed in nonagriculture	48	
Electives in nonagriculture, required	6	
Electives that may be nonagricultural	18	
Total allowed in nonagriculture		72
Required in military science		6
Total semester credits for graduation		130

Any candidate for a degree in agriculture must have had at least six months' farm experience approved by the dean of the Division of Agriculture. A formal statement giving information regarding this experience must be filed in the dean's office during the last semester of the senior year.

The student who completes the freshman and sophomore years will have had, in addition to the fundamental work in chemistry, zoölogy, geology, botany, and English, basic studies in soils, farm crops, live stock, dairying, poultry husbandry, horticulture, and agricultural economics. These two years give the student a general knowledge of the whole range of agriculture, more than one-third of his time being devoted to strictly agricultural courses.

During the junior and senior years the student continues his studies of fundamental science and learns to apply science to agriculture. He is led step by step to understand the scientific relations to every farming operation. There is so much agriculture to be taught that it becomes necessary for the student to determine which of the general lines he should emphasize. This is made possible by numerous electives in soils, crops, agricultural economics, animal husbandry, dairy husbandry, horticulture, milling, and poultry husbandry.

THE CURRICULUM IN AGRICULTURAL ADMINISTRATION

The curriculum in agricultural administration is planned to meet the needs of students preparing for industries that are closely related to farming and in which basic training in both agriculture and business principles is desirable. Important among such industries and occupations are: Rural banking, the marketing and processing of grains, the sale and development of lands, hardware and implement retailing, promotion and sales, writing on farm subjects or in other phases of agricultural journalism, and the teaching of agriculture in high schools and elsewhere. Those wishing to engage in certain specialized types of farming will find this curriculum suited to their needs. An increasing demand for men trained in the business phases of agriculture and closely related industries is coming from industries whose customers are primarily in rural communities. The United States Department of Agriculture, the state agricultural colleges and departments of agriculture, high schools, and many other interests are also in need of men trained along these lines.

The interdependence of town and farm is increasing. Recognition of this increased interdependence is to be found in many of the activities of farmers' and civic organizations in which the farmers and the business men of the towns join to attain mutually desired ends. The business man of the rural town must render service to farmers and service can be rendered best when the needs of customers are understood. In addition, every business man needs to know the principles underlying successful business activity. The curriculum in agricultural administration is planned to give this combined understanding of the needs and problems of agriculture and of the principles that must be observed to make a business successful. Ample opportunity is given to elect business subjects such as accounting, business organization, credit and finance, business law, marketing, and subjects in other related fields.

ANALYSIS OF CURRICULUM IN AGRICULTURAL ADMINISTRATION.

One hundred twenty-four semester credits in addition to military science are required for graduation, as follows:

	Semester credits	
Prescribed in agriculture	25	
Electives in agriculture required with the prerequisites	30	
Required in agriculture		55
Prescribed in nonagriculture	39	
Electives in nonagriculture, required	15	
Electives that may be nonagricultural	15	
Total allowed in nonagriculture		69
Required in military science		6
Total semester credits for graduation		130

The fifteen hours of major electives are chosen from courses in agricultural economics according to the field for which the student is preparing. The other electives in agricultural and nonagricultural subjects are grouped according to the industry or occupation for which the student is preparing.

STATE TEACHER'S CERTIFICATE

By the selection of proper electives in the Department of Education, the four-year curriculum in agriculture or in agricultural administration may not only lead to the degree of Bachelor of Science in agriculture, but also qualify the student for the three-year Kansas state teacher's certificate, renewable for life and valid in any high school or other public school in the state. A student in the curriculum in agriculture, desiring to qualify for teaching, should begin his professional preparation by electing Psychology, first semester, junior year. (This course is required in the first semester of the sophomore year in the curriculum in agricultural administration.) A total of eighteen semester credits in the Department of Education is required for this certificate. These must include the following courses: Psychology, Educational Administration, and Educational Psychology.

STATE CERTIFICATE FOR TEACHERS OF VOCATIONAL AGRICULTURE.

Electives in the curriculum in agricultural administration and in the field of agricultural education may be so chosen as to meet the requirements for the state certificate for the teaching of vocational agriculture in Kansas high schools participating in the federal Smith-Hughes funds. In this case the group of minor electives in related nonagricultural subjects must complete the candidate's professional preparation in education and the group of general electives must include the necessary training in mechanical lines for the handling of farm shop problems. These groups must, therefore, consist of the following courses or their equivalent:

	Semester credits.	
Minor electives		15
Educational Administration B	3	
Educational Psychology	3	
Special Methods of Teaching Agriculture	3	
Supervised Observation and Teaching in Agriculture	3	
Vocational Education	3	
General electives		18
Gas Engines and Tractors	3	
Farm Buildings	3	
Farm Equipment	2	
Farm Sanitation and Water Supply	2	
Farm Carpentry I	3	
Farm Blacksmithing I	1	
Farm Blacksmithing II	1	
Farm Shop Methods	3	
Total		33

CURRICULUM IN LANDSCAPE GARDENING

This four-year curriculum leading to the degree of Bachelor of Science in Agriculture with special training in landscape gardening is planned to prepare those who complete it for the practice of general landscape gardening. The training given includes the engineering features of the profession, the design of landscape improvements, and the plant materials and architectural structures which are used in the arrangement and beautification of both public and private grounds.

As the general culture and wealth of the country increases, one of their most common expressions is the improvement of home surroundings, for both utility and beauty, and the enlargement and beautification of public parks, recreational areas, school grounds, and cemeteries. The design and supervision of this work requires professionally trained men. Those so trained have increasingly great opportunity for profitable, interesting, and valuable employment in a profession which requires the talents of an artist and the practicability of a builder.

THE CURRICULUM IN ANIMAL HUSBANDRY AND VETERINARY MEDICINE

A combined curriculum in animal husbandry and veterinary medicine has been outlined so that students may receive the degree of Bachelor of Science in Agriculture at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two years more, thus securing both degrees in six years.

The outline of this curriculum is to be found in the section of this catalogue under the heading "Division of Veterinary Medicine."

Curriculum in Agriculture

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)*	General Geology Geol. 103	3(3-0)
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
General Chemistry Chem. 110	5(3-6)	General Organic Chemistry Chem. 122	5(3-6)
Live-stock Judging An. Husb. 120	3(2-4)*or*	Elements of Dairying Dairy Husb. 101	3(2-3)*or*
Elements of Dairying Dairy Husb. 101	3(2-3)	Live-stock Judging An. Husb. 120	3(2-4)
Freshman Lectures Gen. Agric. 102	1(2-0)	Library Methods Lib. Ec. 101	1(1-0)
Infantry I Mil. Tr. 101	1½(0-4)	Infantry II Mil. Tr. 102	1½(0-4)
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Agricultural Seminar[1] Gen. Agric. 103	R	Agricultural Seminar[1] Gen. Agric. 103	R
Total	16½	Total	16½

SOPHOMORE

First Semester		Second Semester[2]	
Elements of Horticulture Hort. 107	3(2-3)	Principles of Feeding An. Husb. 152	3(3-0)
Agricultural Economics Ag. Ec. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Anatomy and Physiology Anat. 131	3(2-3)*or*	Farm Crops Agron. 101	4(2-6)*or*
Plant Physiology I[3] Bot. 208	3(3-0)	Soils Agron. 130	4(3-3)
Soils Agron. 130	4(3-3)*or*	General Zoölogy Zoöl. 105	5(3-6)
Farm Crops Agron. 101	4(2-6)	Infantry IV Mil. Tr. 104	1½(0-4)
Farm Poultry Production Poult. Husb. 101	2(1-2, 1)	Physical Education M Phys. Ed. 106	R(0-2)
Infantry III Mil. Tr. 103	1½(0-4)	Agricultural Seminar[1] Gen. Agric. 103	R
Physical Education M Phys. Ed. 105	R(0-2)	Total	16½
Agricultural Seminar[1] Gen. Agric. 103	R		
Total	16½		

* The number before the parenthesis indicates the number of semester hours of credit; the first number within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory each week.

1. Four meetings each semester.
2. Sometime during the second semester of the sophomore year each student is required to file a written statement in the office of the dean of the Division of Agriculture, designating the department of the division in which he will major.
3. Students who do not expect to major in animal husbandry, dairy husbandry, or poultry husbandry may, with the approval of the head of the department in which they expect to major, take Plant Physiology I (Bot. 208) instead of Anatomy and Physiology.

JUNIOR

First Semester		Second Semester	
Genetics An. Husb. 221	3(3-0)	General Entomology Ent. 203	3(2-3)
Plant Pathology I Bot. 205	3(1-4, 2)	Farm Organization Ag. Ec. 106	3(2-3)
Agricultural Microbiology Bact. 106	3(1-6)	Elementary Journalism Ind. Jour. 151	2(2-0)
Electives	7	Journalism Practice I Ind. Jour. 154	2(0-6)
Agricultural Seminar[1] Gen. Agric. 103	R	Electives	6
		Agricultural Seminar[1] Gen. Agric. 103	R
Total	16	Total	16

SENIOR

First Semester		Second Semester	
Electives	16	Agricultural Relationships Gen. Agric. 105	R(1-0)
Agricultural Seminar[1] Gen. Agric. 103	R	Electives	16
		Agricultural Seminar[1] Gen. Agric. 103	R
Total	16	Total	16

Number of semester hours required for graduation, 130.

Electives

The electives in the curriculum in agriculture are grouped as follows:

Semester credits.

MAJOR ELECTIVES 12

These electives may be taken in any one of the departments of the Division of Agriculture. In certain cases also a science department outside of the division may be selected for a major department; *e. g.*, Chemistry, Entomology, Bacteriology.

MINOR AGRICULTURAL ELECTIVES 9

These electives may be taken from one or more departments but must directly strengthen the student's preparation in agriculture.

MINOR NONAGRICULTURAL ELECTIVES 6

These electives must be chosen from one or more of the following departments: Education, Economics and Sociology, History and Government, Mathematics, Modern Languages.

GENERAL ELECTIVES 18

These electives are expected to be chosen because they are adapted to meet individual needs and to round out the preparation provided by the rest of the student's curriculum.

All electives must be officially approved before assignment by both the dean of the Division of Agriculture and the head of the department in which the student majors.

Adaptation of Curriculum in Agriculture for Class of 1931

FRESHMAN

Freshman year of the curriculum in agriculture as outlined on page 100 of catalogue issued under date of May 1, 1927.

1. Four meetings each semester.

SOPHOMORE

First Semester		Second Semester	
Elementary Organic Chemistry Chem. 123	3(2-3)	Elements of Horticulture Hort. 107	3(2-3)
Agricultural Economics Ag. Ec. 101	3(3-0)	Principles of Feeding An. Husb. 152	3(3-0)
Anatomy and Physiology Anat. 131	3(2-3)*or*	Soils Agron. 130	4(3-3)*or*
Plant Physiology I Bot. 208	3(3-0)	Farm Crops Agron. 101	4(2-6)
Soils Agron. 130	4(3-3)*or*	General Zoölogy Zoöl. 105	5(3-6)
Farm Crops Agron. 101	4(2-6)	Infantry IV Mil. Tr. 104	1½(0-4)
Farm Poultry Production Poult. Husb. 101	2(1-2, 1)	Physical Education M Phys. Ed. 106	R(0-2)
Infantry III Mil. Tr. 103	1½(0-4)	Agricultural Seminar Gen. Agric. 103	R
Physical Education M Phys. Ed. 105	R(0-2)		
Agricultural Seminar Gen. Agric. 103	R		
Total	16½	Total	16½

JUNIOR AND SENIOR

Junior and senior years as outlined on a preceding page of this catalogue.

Number of semester hours required for graduation, 134.

Curriculum in Agricultural Administration

FRESHMAN

Freshman year of the Curriculum in Agriculture.

SOPHOMORE

First Semester		Second Semester	
Psychology A Educ. 101	3(3-0)	Elements of Horticulture Hort. 107	3(2-3)
Agricultural Economics Ag. Ec. 101	3(3-0)	Principles of Feeding An. Husb. 152	3(3-0)
College Algebra A Math. 107	5(5-0)	College Rhetoric II Engl. 104	3(3-0)
Soils Agron. 130	4(3-3)*or*	Soils Agron. 130	4(3-3)*or*
Farm Crops Agron. 101	4(2-6)	Farm Crops Agron. 101	4(2-6)
Infantry III Mil. Tr. 103	1½(0-4)	Farm Poultry Production Poult. Husb. 101	2(1-2, 1)
		Infantry IV Mil. Tr. 104	1½(0-4)
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Agricultural Seminar* Gen. Agric. 103	R	Agricultural Seminar* Gen. Agric. 103	R
Total	16½	Total	16½

* Four meetings each semester.

JUNIOR

First Semester		Second Semester	
Elementary Journalism Ind. Jour. 151	2(2-0)	Agricultural Seminar* Gen. Agric. 103	R
Journalism Practice I Ind. Jour. 154	2(0-6)	Electives	16
Agricultural Seminar* Gen. Agric. 103	R	Total	16
Electives	12		
Total	16		

SENIOR

First Semester		Second Semester	
Agricultural Seminar* Gen. Agric. 103	R	Agricultural Relationships Gen. Agric. 105	R(1-0)
Electives	16	Agricultural Seminar* Gen. Agric. 103	R
Total	16	Electives	16
		Total	16

Number of semester hours required for graduation, 130.

Electives

The electives in the curriculum in agricultural administration are grouped as indicated below in the following fields: (1) Rural banking, (2) land economics, (3) grain industries, (4) agricultural journalism, (5) agricultural engineering, and (6) agricultural education.

SEMESTER CREDITS OF ELECTIVES REQUIRED FOR VARIOUS FIELDS

Group.	*Credits in fields 1, 2, 3, 4, 5*	*Credits in field 6*
Major electives in agricultural economics	15	10
Minor agricultural electives (not more than nine semester credits from one department)	15	17
Minor electives in related nonagricultural subjects	15	15
General electives	15	18
Total	60	60

All electives must be officially approved before assignment by both the dean of the Division of Agriculture and the head of the Department of Agricultural Economics.

Adaptation of Curriculum in Agricultural Administration for Class of 1931

The class of 1931 will be held for the freshman year as outlined on page 100 of the catalogue issued under date of May 1, 1927. The other years will be the same as outlined on a preceding page of this catalogue, except that in the second semester of the sophomore year, three semester credits of options will displace College Rhetoric II.

Number of semester credits required for graduation, 134.

* Four meetings each semester.

Curriculum Leading to the Degree of Bachelor of Science in Agriculture, With Special Training in Landscape Gardening

FRESHMAN

Freshman year of the Curriculum in Agriculture.

SOPHOMORE

First Semester		Second Semester	
Object Drawing I Arch. 111	2(0-6)	Plane Trigonometry Math. 101	3(3-0)
Agricultural Economics Ag. Ec. 101	3(3-0)	Object Drawing II Arch. 114	2(0-6)
Plant Physiology I Bot. 208	3(3-0)	General Zoölogy Zoöl. 105	5(3-6)
Soils Agron. 130	4(3-3)	Elements of Horticulture Hort. 107	3(2-3)
Landscape Gardening I Hort. 125	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Infantry III Mil. Tr. 103	1½(0-4)	Infantry IV Mil. Tr. 104	1½(0-4)
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Agricultural Seminar* Gen. Agric. 103	R	Agricultural Seminar* Gen. Agric. 103	R
Total	16½	Total	17½

JUNIOR

First Semester		Second Semester	
Plant Materials I Hort. 224	3(2-3)	General Entomology Ent. 203	3(2-3)
Plant Pathology I Bot. 205	3(1-4, 2)	Elementary Journalism Ind. Jour. 151	2(2-0)
Surveying I Civ. Engr. 102	2(0-6)	Journalism Practice I Ind. Jour. 154	2(0-6)
Theory of Landscape Design Hort. 243	2(2-0)	Surveying II Civ. Engr. 111	2(0-6)
Spraying Hort. 207	3(2-3)	Plant Materials II Hort. 226	3(1-6)
Taxonomic Botany of the Flowering Plants Bot. 225	3(1-4, 2)	Plant Ecology Bot. 228	2(2-0)
Agricultural Seminar* Gen. Agric. 103	R	Forcing Flowers and Vegetables Hort. 221	2(-)
Total	16	Agricultural Seminar* Gen. Agric. 103	R
		Total	16

SENIOR

First Semester		Second Semester	
Landscape Gardening II Hort. 238	3(1-6)	Agricultural Relationships Gen. Agric. 105	R(1-0)
Dendrology Hort. 116	3(1-6)	Silviculture Hort. 119	3(2-3)
Greenhouse Construction and Management Hort. 128	3(3-0)	Landscape Gardening III Hort. 246	3(1-6)
Pencil Rendering and Sketching Arch. 116	2(0-6)	Water Color I Arch. 118	2(0-6)
Landscape Construction Hort. 227	3(2-3)	Civic Art Hort. 223	3(1-6)
Electives	3	Landscape Gardening Problems Hort. 240	4(-)
Agricultural Seminar* Gen. Agric. 103	R	Electives	1
Total	17	Agricultural Seminar* Gen. Agric. 103	R
		Total	16

Number of semester hours required for graduation, 132.

* Four meetings each semester.

Electives in Industrial Journalism

Provision is made for students desiring to prepare for the field of agricultural journalism to major in industrial journalism. They thus secure to a large extent the agricultural training provided in either the curriculum in agriculture or the curriculum in agricultural administration, but instead of securing advanced intensive training in some field of agricultural production or agricultural administration, secure some fundamental training in journalism. They are then well prepared for a large vocational field as agricultural writers, magazine and newspaper publishers, or leaders in other journalistic activities, especially those closely related to agriculture. The electives provided for students selecting such a field for major work are as follows:

Electives for Students of Agriculture Majoring in Industrial Journalism

First Semester	Second Semester
Principles of Advertising 3(3-0)	Industrial Writing 2(2-0)
Industrial Feature Writing I 2(2-0)	Journalism Practice II 2(0-6)
Journalism Practice III 2(0-6)	Editorial Practice 2(2-0)
Copy Reading 2(0-6)	Ethics of Journalism 2(2-0)
The Rural Press 3(3-0)	Journalism Surveys 2(0-6)

Agricultural Economics

Professor Grimes
Professor Green
Associate Professor Evans
Assistant Professor Hodges
Assistant Professor Howe
Instructor Henney
Graduate Assistant Hollister

The investigational work in agricultural economics brings together the latest information concerning the business of farming and of closely related industries. These data are used in the instructional work of the department and illustrate the principles of successful farm organization and operation, the marketing of farm products, and the conduct of business enterprises that are closely related to agriculture. The student has an opportunity to learn of the factors and economic forces involved in marketing, credit, taxation, land utilization, conservation, and similar subjects. Attention is given to the probable future consequences of various policies and practices, in addition to providing opportunity to become acquainted with existing conditions. The student in agricultural economics has exceptional opportunity to work with facts taken from the actual business of farming and of other industries that are closely related to agriculture.

The department is expanding its facilities to meet the growing demand for advanced study. Opportunities of careers for those who are well trained in this field are increasingly favorable, because of the growing importance of agricultural economics to the farmer and in our national life.

The equipment belonging to the department is valued at $5,693.†

COURSES IN AGRICULTURAL ECONOMICS

FOR UNDERGRADUATE CREDIT

101.§ Agricultural Economics. 3(3-0);* I. Prerequisite: Sophomore standing. Dr. Grimes, Mr. Howe, Mr. Henney and Mr. Hollister.

Economic principles as they relate to agriculture. Text: Ely and Wicker, *Elementary Principles of Economics.*

106. Farm Organization. 3(2-3); I and II. Prerequisites: Ag. Ec. 101, Agron. 130, and An. Husb. 152. Dr. Grimes, Mr. Evans, and Mr. Hodges.

The economic factors affecting the organization and operation of the farm business, and their effect on profits. Results from actual farms are studied in the laboratory. Charge, $1.

112. Farm Cost Accountng. 3(2-3); I and II. Prerequisite: Ag. Ec. 101. Mr. Evans, and Mr. Hodges.

Various systems of farm records and accounts. In the laboratory, problems from actual farms. Cost of producing farm products; analysis and utilization of cost of production data. Charge, $1.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Marketing of Farm Products. 3(3-0); I and II. Prerequisite: Ag. Ec. 101. Mr. Green and Mr. Henney.

Price problems affecting time of buying and selling; buyers' and sellers' relations; marketing organizations and the control of marketing, and the adaptability of products to market demands and preferences.

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* The number before the parenthesis indicates the number of semester hours of credit; the first number within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week. I, II, and SS indicate that the course is given the first semester, second semester, and summer session respectively.

§ For an explanation of the system used in numbering courses, see the paragraph on "Course Numbers," given elsewhere in this catalogue.

† The figures for equipment given here and on pages following are based on the official reports of June 30, 1927.

203. Grain Marketing. 3(3-0); I. Prerequisite: Ag. Ec. 202. Mr. Green.
Price influences and price relationships, buying and selling problems; domestic and export trade in grain; grain trade organization; regulation and control of the trade.

204. Transportation of Farm Products. 3(3-0); I. Prerequisite: Ag. Ec. 101. Mr. Henney.
Rate making and other transportation problems having an important influence on the marketing of farm products.

206A. Advanced Farm Organization. 3(2-3); II. Prerequisite: Ag. Ec. 106. Dr. Grimes and Mr. Evans.
Factors affecting the successful organization and operation of the farm business; effects of external factors. A number of the better and more profitable farms are visited.

212. Conservation of Agricultural Resources. 2(2-0); II. Prerequisites: Ag. Ec. 101; junior standing. Mr. Howe.
The world's agricultural resources, the economics of their utilization, and their present and future relationship to human well-being.

218. Agricultural Land Problems. 3(3-0); I. Prerequisite: Ag. Ec. 101. Mr. Howe.
The services of land as a factor in production and the price which is paid as rent for these services.

219. Taxation and Land Ownership. 3(3-0); II. Prerequisite: Ag. Ec. 101, or consult instructor. Mr. Howe.
Analysis of public expenditures and revenues, public credit, and fiscal administration with special emphasis upon the effects of each upon agriculture.

221. Agricultural Finance. 2(2-0); II. Prerequisite: Ag. Ec. 101. Mr. Howe.
Sources and kinds of credit for purchasing farm land and financing farm operations.

227. Farmer Movements. 3(3-0); I. Prerequisite: Ag. Ec. 101. Dr. Grimes.
Farmers' efforts to improve economic status through organization. Principles underlying successful organization of farmers.

231. Agricultural Economics Seminar. 1(1-0); I and II. Prerequisites: Ag. Ec. 101. Dr. Grimes, Mr. Green, Mr. Evans, Mr. Howe, Mr. Hodges, and Mr. Henney.
Current questions in agricultural economics reviewed and discussed; topics prepared and presented by students.

235. Live-stock Marketing. 3(3-0); II. Prerequisite: Ag. Ec. 202. Mr. Henney.
The economics of live-stock marketing and factors affecting live-stock prices.

270. Agricultural Economic Problems. 1 to 4 credits; I, II, and SS. Prerequisites: Ag. Ec. 106 or 202, or such other courses as are necessary for the study of the problem selected. Dr. Grimes, Mr. Green, Mr. Evans, Mr. Hodges, Mr. Howe, and Mr. Henney.

FOR GRADUATE CREDIT

301. Research in Agricultural Economics. 1 to 5 credits; I, II and SS. Prerequisites: Consult instructors. Dr. Grimes, Mr. Green, Mr. Evans, Mr. Hodges, Mr. Howe, and Mr. Henney.
Individual research problems in the marketing of farm products, coöperation among farmers, farmer movements, land problems, tenancy, agricultural industries, agricultural finance, farm labor, farm power, farm organization, and cost of producing farm products. Any of the subjects assigned may furnish data for a master's thesis.

305. Advanced Agricultural Economics. 3(3-0); I. For prerequisites, consult instructor. Mr. Green.

The basic principles of economics, a strengthened foundation in fundamentals; planned readings in the works of leading economists, and discussion of principles and their application to problems confronting specialists in agricultural economics.

310. History of Agricultural Economic Thought. 3(3-0); II. Prerequisites: Consult instructor. Dr. Grimes.

Development of agricultural economics and relation of agricultural economic doctrines to conditions existing when they were formulated.

Agronomy

Professor Throckmorton
Professor Salmon
Professor Parker
Professor Aldous
Associate Professor Duley
Associate Professor Sewell
Associate Professor Zahnley
Associate Professor Laude
Assistant Professor Davis
Assistant Professor Lyons
Assistant Harling
Graduate Assistant Hubbard
Graduate Assistant Martensen

The College farm used by the Department of Agronomy comprises 320 acres of medium rolling upland soil, well suited to experimental and demonstration work. It is well equipped with all kinds of farm machinery necessary in crop production. The general fields and experimental plots used for the breeding and testing of farm crops, and for conducting experiments in soil fertility and methods of culture, afford the student excellent opportunities for study and investigation.

Large and well-equipped laboratories for soil and crop work are maintained for the regular use of students. Material is provided for the study of the grain and forage crops best adapted to different purposes and most suitable for growing in the state. Ample greenhouse space is provided for problems and research work in crops and soils.

The Department of Agronomy offers courses in cereal and forage crop production and improvement, in pasture management, in soils, soil fertility, soil survey, and dry-land farming.

This department owns equipment valued at $32,166.

COURSES IN FARM CROPS

FOR UNDERGRADUATE CREDIT

101. Farm Crops. 4(2-6); I and II. Prerequisite: Bot. 101. Mr. Davis.

The distribution, relative importance, value, and production of the more important grain and forage crops. Deposit, $5.

105. Seed Identification and Weed Control. 2(1-3); I. Prerequisite: Agron. 101. Mr. Zahnley and Mrs. Harling.

Methods of propagation, control, and eradication of weeds.

Laboratory.—Identification of weed plants and seeds; germination and purity testing; field trips. Charge, $2.50.

108. Grain Grading and Judging. 2(0-6); II. Prerequisite: Agron. 101. Mr. Zahnley.

Practice in grading and judging crops and crop products, including wheat, corn, oats, barley, rye, buckwheat, flax, rice, alfalfa, clover, soybeans, cowpeas, and various kinds of hay. Charge, $3.50.

114. Advanced Grain Judging. 2(0-6); I. Prerequisite: Agron. 108. Mr. Zahnley.

Identification, commercial grading and judging, and presenting orally and in writing the merits of samples of the various kinds of field crops. Charge, $3.50.

FOR GRADUATE AND UNDERGRADUATE CREDIT.

202. Crop Improvement. 3(2-3) or 4(2-6); II. Prerequisites: Agron. 101 and An. Husb. 221. Mr. Parker.

Principles of plant breeding reviewed and applied to the principal groups of field crops; methods of selection, hybridization, and breeding for special qualities. Text: Hayes and Garber, *Breeding Crop Plants.*

Laboratory.—A study of heritable characters in crop plants and of laboratory, greenhouse, and field methods of plant breeding. Charge, $2.50.

203. Advanced Forage Crops. 2(1-3); I. Prerequisite: Agron. 101. Mr. Zahnley.

Results of the most recent investigations in forage crops here and abroad; a more intensive study of the sorghums, alfalfa, sweet clover, soy beans, and other important or promising forage crops.

Laboratory.—The growth habits of crops considered in the lecture, especially as related to the production and improvement of these crops, storing, market grading, and marketing of hay. Charge, $1.

205B. Principles of Agronomic Experimentation. 3(2-3); I. Prerequisites: Agron. 101 and 130. Mr. Salmon.

The principles of experimentation in general, and their application to agronomic problems; important contributions to agronomic science studied from the historical and statistical viewpoint. Charge, $2.50.

206. Agronomy Seminar. 1(1-0); II. Prerequisites: Agron. 101 and 130. Mr. Throckmorton.

Students review before the class timely articles appearing in bulletins and current journals.

207. Pasture Improvement. 2(1-3); II. Prerequisites: Bot. 102 and Agron. 101. Mr. Aldous.

Native forage plants, their distribution, value, life history and habits, and their management; management of pastures and ranges, including determination of their carrying capacity, character of stock best suited to a range or pasture, and proper methods of handling areas for maintenance or increase of forage cover.

208. Plant Genetics. 3(3-0); I. Prerequisite: An. Husb. 221. Mr. Parker.

An advanced course for students interested in plant breeding and principles of genetics. Offered in 1928-'29 and alternate years thereafter.

209. Genetics Seminar. 1 credit; the year. Prerequisite: Consult instructors. Dr. Nabours, Mr. Parker, Dr. Warren, Dr. Ibsen, and Dr. Brunson.

Study and criticism of genetic experiments in plants and animals, of the biological and mathematical methods employed, and of the validity of conclusions drawn.

210. Crop Problems. 1(0-3) to 4(0-12); I, II, and SS. Prerequisite: Agron. 203. Mr. Salmon, Mr. Parker, Mr. Aldous, and Mr. Zahnley.

Special problems chosen or assigned; written reports upon completion of problems; credit varies with amount and quality of work done. Deposit, $5.

211. Crop Ecology. 2(2-0); II. Prerequisite: Agron. 101. Mr. Salmon.

Distribution of farm crops with special reference to the climatic, edaphic, economic, and social factors primarily responsible for the concentration of crop production in certain countries; possibilities of further increase in crop-producing areas and probable nature and direction of such increases.

212. Origin and Classification of Crop Plants. 3(1½-4½); I. Prerequisite: Agron. 101. Offered in 1929-'30 and alternate years thereafter. Mr. Parker, Mr. Zahnley, and Mr. Laude.

Geographical and botanical origin of crop plants; characters used in identification of varieties of crop plants and related wild forms. Charge, $2.50.

213. Special Crops. 2(2-0); II. Prerequisite: Agron. 101. Mr. Zahnley.
Distribution, climatic and soil requirements, relative importance, and production of sugar beets, cotton, flax, hemp, tobacco, and other minor crops.

FOR GRADUATE CREDIT

301. Crop Research. 1 to 10 credits; I, II, and SS. Prerequisite: Agron. 203. Mr. Salmon, Mr. Parker, Mr. Aldous, and Mr. Zahnley.
Special problems chosen or assigned, resulting data being available for master's thesis. Charge, $5.

302. Pasture Improvement Research. 1 to 5 credits; I, II, and SS. Prerequisites: Agron. 207, Civ. Engr. 111, and Bot. 225. Mr. Aldous.
Special problems chosen or assigned; investigations may furnish data for master's thesis.

303. Plant Breeding Literature. 1(0-3); I, II, and SS. Prerequisite: An. Husb. 221. Mr. Parker.
An opportunity is offered to familiarize students with current literature in genetics and plant breeding.

COURSES IN SOILS

FOR UNDERGRADUATE CREDIT

130. Soils. 4(3-3); I and II. Prerequisites: Chem. 110 and Geol. 103. Mr. Throckmorton and Mr. Lyons.
Fundamental principles underlying the management of soils. Charge, $3.50.

FOR GRADUATE AND UNDERGRADUATE CREDIT

231. Dry-land Farming. 2(2-0); I. Prerequisite: Agron. 130. Mr. Lyons.
Principles underlying the cultivation methods and farming systems under light rainfall conditions.

232A. Advanced Soil Fertility. 3(2-3); I. Prerequisite: Agron. 130. Dr. Duley.
Physical, chemical, and biological factors which influence the fertility of the soil and practical use of manure, fertilizer, lime, and legumes. Charge, $5.

233. Soil Survey. 2(1-3); II. Prerequisite: Agron. 130. Mr. Lyons.
Types of soils of the United States and methods of mapping soil areas; special attention to study of Kansas soils in the field. Charge, $1.

235. Advanced Soils Laboratory. 1(0-3) to 4(0-12); I, II, or the year. Prerequisite: Agron. 130. Dr. Duley, Dr. Sewell, and Mr. Lyons.
The more advanced problems of soil physics and fertility, the making of mechanical analyses; determination of moisture equivalent; specific heat; pot work with soils in the greenhouse. Charge, $2.50.

236. Soil Problems. 1(0-3) to 4(0-12); I, II, and SS. Prerequisites depend on problem assigned. Mr. Throckmorton, Dr. Sewell, and Dr. Duley.
Special problems in soils, chosen or assigned. Deposit, $5.

243. Soil and Crop Management. 3(2-3); II. Prerequisites: Agron. 101 and 130. Dr. Duley.
Discussion and investigation of practical management of soils and crops.

247. Interrelations of Soils and Crop Plants. 3(3-0); II. Prerequisites: Agron. 130 and Bot. 208. Dr. Sewell.
Chemical laws, plant physiology, and ecological factors applied to soil problems in relation to crop production.

FOR GRADUATE CREDIT

331. Soil Research. 1 to 10 credits; I, II, and SS. Prerequisites: Agron. 130 and Chem. 250. Mr. Throckmorton, Dr. Duley, and Dr. Sewell.
Special soil problems, which may extend throughout the year and furnish data for a master's thesis. Charge, $5.

Animal Husbandry

Professor McCampbell
Professor Bell
Professor Ibsen
Associate Professor Reed
Associate Professor Anderson
Assistant Professor Aubel
Assistant Professor Mackintosh
Instructor Alexander
Graduate Assistant Risty
Graduate Assistant Culbertson

The courses of study in this department are arranged to give the student special instruction in the selection, breeding, feeding, marketing, and management of all classes of live stock.

The department devotes 624 acres of land to the maintenance of herds and flocks of pure-bred horses, cattle, sheep, and hogs. The College live stock has attained a national reputation among breeders and feeders on account of the many prize-winning animals produced.

This department feeds experimentally from 750 to 1,000 animals each year. This affords excellent opportunity to study feeding animals and problems in feeding.

The feed yards and barns are well arranged for experimental feeding and the maintenance of the herds. The laboratory of the animal husbandry student is the feed lot and the judging pavilion. He studies the animal from the standpoint of the breeder and of the feeder. He learns to combine the needs of each and to find those qualities in the animal best suited to meet these needs.

The department owns equipment valued at $34,320. This includes live stock having a value of $23,346.

COURSES IN ANIMAL HUSBANDRY

FOR UNDERGRADUATE CREDIT

120. Live-stock Judging. 3(2-4); I and II. Mr. Bell, Mr. Mackintosh, and Mr. Alexander.

Type conformation and quality of market and breeding live stock, also breed characteristics and character in breeding live stock. Texts: Vaughn, *Types and Market Classes of Live Stock* and Plumb, *Types and Breeds of Farm Animals.* Charge, 50 cents.

140. Advanced Stock Judging I. 2(0-6); I. Prerequisite: An. Husb. 120. Mr. Bell.

The judging of market animals and of different breeds of pure-bred stock, four to six animals in a group as is customary at county and state fairs. Charge, 50 cents.

143. Advanced Stock Judging II. 2(0-6); II. Prerequisite: An. Husb. 140. Mr. Bell.

Continuation of An. Husb. 140; occasional trips to the best live-stock farms of the state, where the management of herds and flocks as handled by the most successful stockmen of the state are judged and observed. Charge, 50 cents.

146. Form and Function in Live Stock. 2(0-6); I. Prerequisite: An. Husb. 143 and 180. Mr. Bell.

A detailed and specific study of animal form and type, and influence of type upon function; relation of form, type, and condition to growth and development; comparative measurements of growing and fattening animals, speed and draft horses, mutton and wool sheep, and lard and bacon types of hogs, special training in presenting orally the relative merits of animals of all breeds. Charge, 50 cents.

149. History of Breeds and Pedigrees. 3(2-3); I. Prerequisite: An. Husb. 120. Mr. Mackintosh.

The early history and development of pure-bred domestic animals; herd-books and pedigrees; the leading strains and families of the different breeds

of horses, cattle, sheep, and swine. Text: Plumb, *Types and Breeds of Farm Animals.* Charge, $1.

152. Principles of Feeding. 3(3-0); II. Prerequisites: Anat. 131 and Chem. 106. Mr. Anderson.

The digestive system and processes of nutrition; the origin, chemical analysis, grades, and feeding values of different feeds; the theory of practical economy of rations for the maintenance and for the fattening of all classes of farm animals. Text: Henry and Morrison, *Feeds and Feeding,* Parts I and II.

155. Beef-cattle Production. 3(2-3); II. Prerequisites: An. Husb. 120, 180, and 152. Dr. McCampbell and Mr. Anderson.

Economical methods of growing and fattening market cattle; practice in feeding, management, and housing of cattle.

158. Swine Production. 3(2-3); II. Prerequisites: An. Husb. 120, 180, and 152. Mr. Aubel.

Economical methods of growing swine for the market; practice in the feeding, management, and housing of swine. Text: Smith, *Pork Production.*

161. Sheep Production. 3(2-3); I. Prerequisites: An. Husb. 120, 180, and 152. Mr. Reed.

Economical methods of growing, fitting, and finishing sheep for market; practice in the feeding, management, and housing of sheep. Text: Coffey, *Productive Sheep Husbandry.*

164. Horse Production. 3(2-3); I. Prerequisites: An. Husb. 120, 180, and 152. Mr. Mackintosh.

Economical methods for growing, handling, and housing horses for breeding purposes, for work, and for the market; practice in feeding, handling, and housing horses. Text: Gray, *Productive Horse Husbandry.*

167. Meats. 2(1-3); II. Prerequisites: An. Husb. 120 and 152. Mr. Mackintosh.

Killing and dressing, cutting, and curing meats. Text: Hesler, *Farm Meats.* Charge, $1.

171. Live-stock Production. 3(3-0); II and SS. Prerequisite: An. Husb. 152 or 172. Open only to juniors and seniors not majoring in animal husbandry. Mr. Bell.

Practical insight into the production of beef cattle, horses, swine, and sheep.

172. Feeding Live Stock. 3(3-0); II. Open only to students in agricultural administration and agricultural engineering. Mr. Alexander.

The processes of digestion and assimilation, the food requirements of different animals, methods of calculating rations, and the relative feeding value of different feeds. Text: Bull, *Principles of Feeding Farm Animals.*

176. Meats HE. 1(0-3); II. For juniors and seniors in home economics. Prerequisite: Food and Nut. 106. Mr. Mackintosh.

The selection, cutting, and curing of meats; particular attention to grading of carcasses and the uses of the various cuts of meats. Charge, $1.

180. Fitting and Showing Live Stock. 2(1-3); I. Prerequisite: An. Husb. 152 or 172. Mr. Reed, Mr. Anderson, Mr. Aubel, and Mr. Mackintosh.

The why and how of showing live stock at local, county, state, and national live-stock shows.

FOR GRADUATE AND UNDERGRADUATE CREDIT

221. Genetics. 3(3-0); I, II, and SS. Prerequisites: Zoöl. 105 and Bot. 105. Dr. Ibsen.

A general study of variation, Mendelian inheritance, and related subjects.

223. Animal Breeding. 3(3-0); I. Prerequisite: An. Husb. 221. Mr. Aubel.

The physiology of reproduction; general principles of heredity; variation; systems of mating; influence of pedigrees and herdbook standard; and an analysis of the breeding practices of leading breeders.

225. Advanced Genetics. 4(3-3); II. Prerequisite: An. Husb. 221. Dr. Ibsen.

Genetics studied in greater detail than in An. Husb. 221; particular attention to the relation of chromosomes to heredity.

227. Genetics Seminar. 1 credit; the year. Prerequisites: Consult instructors. Dr. Nabours, Dr. Ibsen, Mr. Parker, and Dr. Warren.

Genetic experiments in plants and animals, the biological and mathematical methods employed, and validity of conclusions drawn.

229. Research in Genetics. 1 to 10 credits; I and II. Prerequisite: An. Husb. 225. Dr. Ibsen.

A two-semester course offering opportunity for individual study of problems in which small mammals are used as the experimental animals.

231. Advanced Studies in Pedigrees. 3(1-6); II. Prerequisite: An. Husb. 149. Mr. Mackintosh.

Pedigrees and prepotency of individuals representing the more important strains and families of beef cattle, horses, sheep, and swine.

233. Advanced Feeding. 2(2-0); I. Prerequisite: An. Husb. 152. Mr. Anderson.

A survey of the experimental feeding of horses, cattle, sheep, and hogs; fundamental and practical feeding problems of the various sections of the country; results obtained in experimental investigation of these problems.

244. Animal Husbandry Seminar. 1(1-0); II. Open only to seniors and graduate students majoring in animal husbandry. Prerequisite: An. Husb. 152. Mr. Reed.

245. Animal Husbandry Problems. 1 to 5 credits; I, II, and SS. Prerequisites: An. Husb. 152 and other courses; consult instructor. Dr. McCampbell.

250. Pure-bred Live-Stock Production. 2(2-0); II. Prerequisite: An. Husb. 149 and 223; senior or graduate standing. Mr. Reed.

The real function of pure-bred live stock; the many factors upon which the successful production of pure-bred live stock depends; and possibilities in pure-bred live-stock production.

260. The American Live-stock and Meat Industry. 3(3-0); II. Prerequisites: An Husb. 120 and 152. Dr. McCampbell.

An advanced study of the live-stock and meat industry; its organization, operation, and development; and the relation of its diversified activities to each other and to the public. Text: Clemen, *The Live-stock and Meat Industry,* supplemented with lectures, assigned readings, and reports.

268. Live-stock Experimental Methods. 2(2-0); II. Prerequisites: An. Husb. 152 and 221. Dr. McCampbell and Dr. Ibsen.

How to plan, conduct, and interpret experiments involving the use of animals.

FOR GRADUATE CREDIT

301. Research in Animal Husbandry. 1 to 10 credits; I and II. Prerequisites: An. Husb. 155, 158, 161, and 164. Dr. McCampbell.

Special problems in beef-cattle production, swine production, sheep production, horse production, pure-bred live-stock production, and genetics.

306. Advanced Meats. 1 to 4 credits; II. Prerequisite: An. Husb. 167. Mr. Mackintosh.

Grading of carcasses; studies in nutritive value of different grades of meat; factors influencing the quality of meats; factors influencing dressing percentage of meat animals; and identification of meats from different animals.

311. The Wool Industry. 3(2-3); II. Prerequisite: An. Husb. 161. Mr. Reed.

The supply of wool and the demand for it; and the method of producing, marketing, storing, grading, and manufacturing wool.

Dairy Husbandry

Professor Fitch
Professor Cave
Associate Professor Martin
Assistant Professor Lush
Instructor Brooks
Instructor Caulfield
Graduate Assistant Warren

The activities of the Department of Dairy Husbandry may be divided into two groups: those that deal with the production of milk and those that deal with the marketing and manufacturing of the several dairy products. In order to get first-hand information a dairy herd is maintained and a creamery operated. The animals in the dairy herd are used by judging classes and in experiments in the feeding, care, and management of dairy animals. Up-to-date methods in creamery operation are exemplified in the creamery.

The dairy herd consists of excellent types of the four dairy breeds: Jersey, Guernsey, Ayrshire, and Holstein. These animals are pure bred, and a number have been entered in the advanced registry of their respective breeds. The excellence of the herd is shown by the yearly records of the cows that have been officially tested. The average for the Guernseys is 9,532 pounds of milk and 432 pounds of butter fat; for the Ayrshires, 11,614 pounds of milk and 442 pounds of butter fat; for the Holsteins, 13,925 pounds of milk and 492 pounds of butter fat; and for Jerseys 6,897 pounds of milk and 400 pounds of butter fat.

The Department of Dairy Husbandry is provided with ample room in the west wing of Waters Hall. The creamery is located in a one-story annex on the north end of this wing. In this building the department has the most up-to-date equipment available for handling butter, cheese, milk, ice cream, and condensed milk on a quantity basis, and is equipped far better than ever before to instruct students interested in the manufacturing side of dairying.

Students who have specialized in dairying are now among the leading dairy-cattle breeders of the state. Others who were interested in the manufacturing side of dairying are in responsible positions with creameries and milk companies or in business for themselves. The dairy industry is expanding in Kansas, and this is bringing a greater demand for men with experience and knowledge of dairying.

The instruction in the Department of Dairy Husbandry includes the study of the selection and breeding of dairy animals, the production of milk, its manufacture into butter, cheese, and other dairy products, and its sale on the market. The success of the instruction in judging dairy animals may be assumed from the fact that in thirteen contests the Kansas team has averaged better than third place.

This department owns equipment valued at $55,509. This figure includes live stock to the value of $29,085.

COURSES IN DAIRY HUSBANDRY

FOR UNDERGRADUATE CREDIT.

101. Elements of Dairying. 3(2-3); I, II, and SS. Mr. Cave, Mr. Lush, Mr. Caulfield, and Mr. Brooks.

The secretion, composition, and properties of milk; factors influencing the quantity and quality of milk; care of milk and cream on the farm; different methods of creaming; construction and operation of farm separators; principles and application of the Babcock test; use of the lactometer; and butter making on the farm. Text: Judkins, *Principles of Dairying.*

Laboratory.—Practice in making the Babcock test, in use of the lactometer, in separation of milk, and in farm butter making. Charge, $2.

104. Dairy Judging. 1(0-3); I and II. Mr. Lush and Mr. Brooks.

Judging dairy stock from the standpoint of economical production and breed type. Reference: *Types and Breeds of Farm Animals* by Plumb, and breed-association literature.

106. Dairy Inspection I. 2(1-3); I. Prerequisites: Bact. 106 and Dairy Husb. 101. Mr. Caulfield.

Advanced work in the testing of dairy products and testing for adulterations; practice in use of score cards for inspecting and grading milk plants, farm dairies, and creameries; outlining of state and city ordinances governing the handling and public sale of dairy products; training in duties of city, state, and government inspectors. Charge, $3.

108. Milk Production. 3(3-0); II. Prerequisites: Dairy Husb. 101 and An. Husb. 152 or 172. Mr. Fitch.

Economical production of milk and the most approved method of handling the dairy herd; construction of dairy barns and buildings; other subjects relating to the dairy farmer. Text: Eckles, *Dairy Cattle and Milk Production.*

109. Butter Making I. 3(2-3); I. Prerequisites: Dairy Husb. 101 and Bact. 211. Mr. Martin.

Principles of creamery butter making; construction and care of creameries and their appliances; methods of sampling and grading cream; pasteurization; starter making; cream ripening; and creamery accounting. Text: Hunziker, *The Butter Industry.*

Laboratory.—Practice in the sampling and grading of milk and cream, etc.; the making of salt, fat, and moisture determinations of the finished product; judging and scoring butter. Charge, $3.

111. Butter Making II. 4(2-6); I. Prerequisites: Dairy Husb. 101 and Bact. 211. Mr. Martin.

Similar to course 109; for students specializing in dairy manufacturing. Charge, $3.

116A. Market Milk. 3(2-3); II. Prerequisites: Dairy Husb. 101 and Bact. 211. Mr. Martin and Mr. Caulfield.

Classes of market milk; equipment and methods for clean milk production; relation of clean milk to producer, dealer, and consumer; systems of milk inspection, score cards, and milk and cream contests; milk plants, including their methods and equipment. Text: Kelley and Clement, *Market Milk.*

Laboratory.—Actual practice in all the steps in the production of market milk and cream in the College milk plant. Charge, $3.

118. Dairy Inspection II. (Vet.) 1(0-3); II. Mr. Caulfield.

The testing of dairy products; the inspection and scoring of dairies and milk depots; the testing for adulterants in dairy products. Text: Newlander, *Testing Dairy Products.* Charge, $3.

120. Advanced Dairy Judging. 1(0-3); II. Mr. Cave.

Continuation of Dairy Husb. 104; visits to the best farms of the state; opportunity to judge and handle stock kept by the most successful breeders.

127. Condensed and Powdered Milk. 2(1-3); I. Prerequisite: Dairy Husb. 116 and Bact. 211. Mr. Martin.

The history of milk condensing, methods of manufacture, condensing machinery, and the powdered milk industry.

Laboratory.—Condensing milk in the college plant.

130. Ice-cream Making. 3(2-3); II. Prerequisites: Dairy Husb. 106 and 116. Mr. Martin.

A thorough study of the science and practice of the commercial manufacture of ice cream and ices. Text: Fisk, *Book of Ice Cream.*

Laboratory.—Practice in all phases of the manufacture of ice cream and ices in the college plant. Charge, $3.

135A. Cheese Making. 2(1-3); II. Prerequisites: Dairy Husb. 106 and Bact. 211. Mr. Caulfield.

Manufacture of American cheddar cheese, soft cheeses, and the most important foreign varieties.

Laboratory.—Actual manufacture of the various types of cheese. Charge, $3.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Dairy Seminar. 1(1-0); II. Prerequisites: Dairy Husb. 101, 106, and 108. Mr. Fitch.

A study and review of dairy periodicals and experiment station bulletins, books, and other dairy literature.

207. Feeding and Management of Dairy Cattle. 3(2-3); II. Prerequisites: Dairy Husb. 108 and An. Husb. 152. Mr. Cave.

An advanced course in feeding as it applies to dairy cattle under ordinary conditions and to cows on advanced registry test; general management problems and the fitting of animals for show and sale. Reference texts: Larson and Putney, *Dairy Cattle Feeding and Management,* and Eckles, *Dairy Cattle and Milk Production.* Charge, $1.

211. Dairy Breeds and Pedigrees. 2(1-3); I. Prerequisite: Dairy Husb. 108. Mr. Lush.

The history and development of the different breeds of dairy cattle.

Laboratory.—Study of the herdbooks of the dairy breeds and study of the pedigrees of some of the prominent animals of each breed. Charge, $1.

216. Dairy Production Problems. 1 to 5 credits; I and II. Prerequisites: Dairy Husb. 101, 104, and 108, and An. Husb. 152. Mr. Fitch and Mr. Cave.

An investigation pertaining to dairy production problems, plans for said investigation to be so formulated that the study may be continued for more than one semester, if necessary.

221. Dairy Manufacturing Problems. 1 to 5 credits; I and II. Prerequisites: Dairy Husb. 101, 106, 108, 111, and 114. Mr. Martin.

An investigation pertaining to dairy manufacturing problems, plans for said investigation to be so formulated that, if necessary, the study may be continued for more than one semester.

226. Creamery Management. 2(2-0); II. Prerequisite: Dairy Husb. 111. Mr. Martin.

An advanced course in creamery management for students specializing in dairy manufacturing.

FOR GRADUATE CREDIT

301. Dairy Research. 1 to 10 credits; I and II. Prerequisites: Dairy Husb. 108, 109, 206, 211, or 108, 111, 116, and 226.

Special investigations in dairy husbandry or dairy manufactures which may form the basis of a thesis in partial fulfillment of the requirement for the degree of master of science.

General Agriculture

Dean Call

102. Freshman Lectures. 1(2-0); I. Dean, assistant dean, heads of departments and freshman advisers of the Division of Agriculture, assisted by a professor of education and various other members of the College faculty.

A two-fold object: (1) To assist in development of ability to study effectively, and (2) to inform regarding prospective opportunities for service in various fields of work open to agricultural graduates, and requirements for success in these fields; and regarding the relationship between agricultural and other subject matter in well-balanced agricultural training.

103. Agricultural Seminar. R(four meetings each semester).

Discussion of general agricultural questions and of agricultural student affairs; programs presented by students, members of the faculty, and invited speakers from outside.

105. Agricultural Relationships. R(1-0); II.
Agricultural graduates and their duties, responsibilities, and opportunities for service as citizens of the agricultural community and as specialists in various phases of agricultural activity.

Horticulture

Professor Dickens
Professor Barnett
Assistant Professor Pickett
Assistant Professor Balch
Assistant Profesor Quinlan
Graduate Assistant Amstein

Instruction offered in the Department of Horticulture covers pomology, vegetable gardening, greenhouse practice, forestry, and all phases of landscape gardening.

The horticultural farm consists of eighty acres of land devoted exclusively to horticultural and forestry work. A full equipment of garden tools, spraying machinery and accessories, pruning tools, and special apparatus for floriculture is available at all times for the use of students. The College grounds furnish one of the finest and most complete laboratories in the state for the study of landscape gardening and on them are located the vegetable gardens.

Instruction in landscape gardening is planned to meet the requirements of two classes of students: (1) Students who wish a general knowledge of the principles underlying landscape gardening; (2) students who wish to specialize in landscape gardening. A complete curriculum, with the coöperation of the Departments of Civil Engineering and Architecture, is offered the latter students. (See "Curriculum leading to the degree of bachelor of science in agriculture with special training in landscape gardening.")

The value of the equipment belonging to this department is $7,334.

COURSES IN HORTICULTURE

FOR UNDERGRADUATE CREDIT

105. Systematic Pomology. 4(2-6); I. Prerequisite: Hort. 107. Mr. Barnett and Mr. Pickett.

Technical study of fruit varieties, including varietal relationships; principles underlying pomological nomenclature, variety description, and artificial and natural systems of variety classifications. Text: Hedrick, *Systematic Pomology.*

Laboratory.—Study of actual fruits, from many parts of the United States; description, identification, judging, and preparation of fruit displays. Charge, $1.

107. Elements of Horticulture. 3(2-3); I and II. Prerequisite: Bot. 105. Mr. Barnett and Mr. Pickett.

The relation of the more important subdivisions of horticulture to general agriculture and to advanced courses in pomology and olericulture; practices necessary for success in orcharding and gardening and the principles on which these practices are based. Text: Gardner, Bradford, and Hooker, *Orcharding.*

Laboratory.—Study of fruit-bearing habits, propagation, pruning, spraying, transplanting, cover crops, fruit varieties, etc. Charge, $1.

110. Small Fruits. 2(2-0); II and SS. Prerequisite: Bot. 105. Mr. Barnett.

Culture, harvesting and marketing small fruits; management of home and commercial plantations. Text: Sears, *Productive Small Fruit Culture.*

114. Farm Forestry. 3(2-3); I. Mr. Dickens.

The needs of Kansas farms for windbreaks and wood lots for post and fuel production; forest conservation and methods of handling timber; the growing of trees in locations better suited for timber than for other crops; composition of windbreaks and their value as protection to home orchards and fields. Text: Ferguson, *Farm Forestry.*

Laboratory.—Identification of species, methods of forming windbreaks, nursery work in transplanting trees of various sizes, determination of rate of growth of trees under various conditions.

116. Dendrology. 3(1-6); I. Prerequisite: Bot. 105. Mr. Dickens.
Classification and identification of forest trees; forest ecology and taxonomy; classification of commercial species; relative importance of timber species; the life history and requirements of trees.

Laboratory.—Studies in the College arboretum and excursions to nearby wood lots; becoming acquainted with trees that do well in Kansas.

119. Silviculture. 3(2-3); II. Prerequisite: Hort. 114 or 116. Mr. Dickens.
The business of tree growing for economic purposes; requirements of species, their range and requirements as to soils, climate and the various factors that determine their reproduction and rate of growth; protection of forests from fires and insects; and the applications of various systems of silviculture. Text: Toumey, *Seeding and Planting in the Practice of Forestry.*

122. Gardening. 3(3-0); I and II. Not open to those who have received credit in Hort. 125.
A course in landscape gardening appreciation, the purpose of which is to afford sufficient knowledge of the art to enable the student to become acquainted with the fundamental principles underlying its application to the building and improving of the home grounds. Text: Waugh, *Book of Landscape Gardening.*

125. Landscape Gardening I. 3(3-0); I and SS. Mr. Quinlan.
An introductory course designed to give the student the fundamental principles governing the adaptation of areas for human use and enjoyment; an outline study of the literature and historic development of landscape gardening; written reports on assigned topics relative to the natural landscape and designed areas.

128. Greenhouse Construction and Management. 3(3-0); I. Mr. Balch.
The more important points of greenhouse construction and the proper methods of greenhouse management; the commercial standpoint and private conservatories.

129. Floral Arrangement. 2(1-3); I. Mr. Balch.
The use of flowers and floral pieces for the home and the store. Text White, *Principles of Flower Arrangement.*

Laboratory.—The arrangement of seasonable flowers for various uses.

130. School Gardening. 2(2-0); SS. Mr. Balch.
A general study of soils, insects, diseases, and machinery as related to vegetable crops and their culture.

133. Elements of Vegetable Gardening. 3(2-3); II. Mr. Balch.
The practices necessary for success in vegetable gardening—the fundamentals for the student who becomes a teacher, a county agricultural agent, or a vegetable grower, and a foundation for advanced courses in vegetable production. Charge, $1.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Practical Pomology. 3(2-3); II. Prerequisite: Hort. 105. Mr. Barnett and Mr. Pickett.
Fruit geography, orchard locations, financing the orchard, orchard equipment, orchard economics, fruit manufactured products, and fruit marketing. Lectures and recitations.

Laboratory.—Laboratory practice in grading and packing fruits, intensive field work in identification of fruit plant varieties; a thorough study of storage practice. Charge, $1.

202. Subtropical Pomology. 2(2-0); II. Prerequisite: Hort. 105. Mr Barnett.

The geography and methods of production of the principal subtropical fruits grown in the United States. Text: Hume, *Cultivation of Citrus Fruits,* and assigned readings.

205. Advanced Pomology. 3(2-3); I. Prerequisite: Hort. 105. Mr. Barnett and Mr. Pickett.

A course on the fundamentals of orcharding. Text: Chandler, *Fruit Growing.*

Laboratory.—Advanced apple judging; production and marketing studies. Charge, $1.

207. Spraying. 3(2-3); I. Prerequisite: Chem. 110. Mr. Pickett.

Spray machinery and accessories; chemical properties, manufacture and use of the important insecticides and fungicides; determination of spray dates.

Laboratory.—Preparation and testing of spray materials; special study of spray machinery and accessories. Charge, $1.

209. Orchard Problems. 1 to 5 credits; I or II. Prerequisites: Hort. 105, and senior or graduate standing. Mr. Dickens.

Problems related to commercial orcharding, such as orchard surveys, production costs, root-stock adaptations, pruning tests, and studies of fruit in common storage. A charge may be made.

210. Market Gardening. 3(2-3); II. Prerequisites: Agron. 130 and Hort. 133. Mr. Balch.

The business side of market gardening; preparation of seed orders; estimates of cost per acre of growing various garden crops; harvesting, storing, and marketing vegetables. Text: Thompson, *Vegetable Crops.*

Laboratory.—Each student is assigned a plot of ground to plant and care for during the semester. Careful records of cultural operations and of yields; disease and insect control. Charge, $1.

218. Market-Gardening Problems. 1 to 5 credits. Prerequisite: Hort. 210. Mr. Balch.

The important methods of production of standard vegetables of both garden and greenhouse; problems of marketing, storage and shipping.

221. Forcing Flowers and Vegetables. 1 to 5 credits. Prerequisite: Hort. 128 or 133. Mr. Balch.

Propagation and cultural methods, soil studies, ventilation, heating, watering, and the control of greenhouse pests.

223. Civic Art. 3(1-6); II. Prerequisite: Hort. 243. Mr. Quinlan.

A study of the growth and development of cities and towns, with special reference to their needs and improvement; emphasis is laid on the design of open areas for public use, such as grounds for public buildings, community and civic centers, and passing-through parks; the organization of urban areas into districts; land subdivision; transportation; traffic. Text: James, *Land Planning.*

224. Plant Materials I. 3(2-3); I. Prerequisite: Bot. 105. Mr. Quinlan.

Study and identification of trees, shrubs, vines, perennials, and annuals for general ornamental planting.

226. Plant Materials II. 3(1-6); II. Prerequisite: Hort. 224. Mr. Quinlan.

Practical use of plant materials in landscape gardening with reference to types and kinds of gardens, private and public areas. Planting plans, sketches, elevations, estimates, and written reports will be required.

227. Landscape Construction. 3(2-3); I. Prerequisite: Civil Engr. 111. Mr. Quinlan.

Interpretation of topographic maps; preparation of grading plans; structures in relation to the topography; sewage, water supply, lighting, and drainage on the private estate.

235. Horticulture Seminar. 1(1-0); I and II. Prerequisites: Hort. 105 and 133 or 128. Mr. Barnett.

A study and critical discussion of recent horticultural publications and of experimental and research projects now under way in this and other agricultural experiment stations.

238. Landscape Gardening II. 3(1-6); II. Prerequisites: Hort. 125 and 226. Mr. Quinlan.

An elementary course in the designing of the home grounds, the country estate, special gardens, and playgrounds. Several sketch problems will be given during the course. Charge, $1.

240. Landscape Gardening Problems. 1 to 5 credits. Prerequisites: Hort. 238 and 243. Mr. Quinlan.

In this course the student solves original advanced problems in landscape design, construction, maintenance, and materials for landscape gardening. The course may extend through the school year.

243. Theory of Landscape Design. 2(2-0); I. Prerequisite: Hort. 126. Mr. Quinlan.

The economic and æsthetic theory of design; taste, character, historic styles, composition; natural elements in design; and planting design.

246. Landscape Gardening III. 3(1-6); II and SS. Prerequisites: Hort. 226, 243, and 238. Mr. Quinlan.

Advanced course in designing of large parks, cemeteries, golf courses, educational groups, and high-class land subdivisions; construction details; contracts and specifications. Several sketch problems will be given during the course. Charge, $1.

FOR GRADUATE CREDIT

316. Horticultural Research. 1 to 10 credits; I, II, and SS. Prerequisites: Consult instructor. Mr. Dickens, Mr. Barnett, Mr. Balch, and Mr. Quinlan.

Any feasible problem relating to the student's major line of graduate study —pomology, olericulture, forestry, or landscape gardening. Data collected may form basis for a master's thesis.

Milling Industry

Professor Swanson
Associate Professor Working
Instructor Pence
Miller Oakes

The milling of wheat and other cereals is one of the leading manufacturing industries of the United States, and milling products constitute over one-third of the total food materials produced in the United States. An industry of such magnitude calls for technically trained men. Kansas is the center of the hard-winter-wheat belt, and flour milling is the second manufacturing industry in the state.

The department has a well-equipped flour mill, consisting of six double stand rolls with necessary wheat-cleaning machinery, sifters, purifiers, and dust collectors. The equipment is equal to that found in the commercial mills of the same capacity.

The baking laboratory is equipped with dough mixer, proofing closet, baking oven, and other necessary apparatus. The chemical laboratory contains the apparatus needed for flour and wheat testing. For advanced work there are available a hydrogen-ion potentiometer, and apparatus for making conductivity measurements and viscosity tests.

The department owns equipment valued at $36,176.

COURSES IN MILLING INDUSTRY

FOR UNDERGRADUATE CREDIT

104. Principles of Milling I. 2(1-3); II. Dr. Swanson and Mr. Oakes.
The theory and principles of flour-milling operations; practice work on an experimental mill. Charge, $2.

106. Principles of Milling II. 1(0-3); II. Mr. Pence and Mr. Oakes.
Wheat conditioning and the study of the course of different products through the mill with the aid of a flow-sheet. Charge, $2.

109. Milling Practice I. 3(1-6); I. Prerequisite: Mill. Ind. 106. Mr. Pence and Mr. Oakes.
A study of the operation of wheat-cleaning machines, tempering controls, grinders, sifters, and purifiers. Charge, $2.

111. Milling Practice II. 3(1-6); II. Prerequisite: Mill. Ind. 109. Mr. Pence and Mr. Oakes.
Relation of roll and bolting surfaces, flour blending, redressing, principles of bleaching, belt management, lubrication, spout construction, methods of checking mill operation. Charge, $2.

115. Thesis. 1 to 5 credits; I and II. Dr. Swanson, Dr. Working, and Mr. Pence.
Experimental work on problems connected with flour milling or the testing of wheat and flour, the subject of investigation to be selected in consultation with the head of the department at the beginning of the senior year.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Milling Technology I. 2(0-6); I. Prerequisite: Mill. Ind. 111. Mr. Pence.
Problems related to management of flour mill operations, variation in wheat conditioning, corrugation, roll spiral, roll surfaces, purifiers, and bolters. Charge, $2.

202. Milling Technology II. 2(0-6); II. Prerequisite: Mill. Ind. 201. Mr. Pence.
Study of the influence of external conditions on flour-mill operations, management of air control, exhaust, dust collectors, flour bleachers, determining the flow of mill streams. Charge, $2.

205. Wheat and Flour Testing. 3(0-9); I. Prerequisites: Mill. Ind. 212 and Chem. 106 and 251 or 260. Dr. Working.
Special quantitative tests applied to cereals and their products; methods of analysis and interpretation of results. Deposit, $7.50.

206. Experimental Baking. 3(1-6); II. Prerequisite: Mill. Ind. 205. Dr. Working.
Practice in baking tests; comparison of methods, formulas, and flours; interpretation of results. Charge, $4.

210. Advanced Wheat and Flour Testing. 1 to 5 credits; I and II. Prerequisites: Mill. Ind. 205 and other courses; consult instructors. Dr. Swanson and Dr. Working.
Physico-chemical and other methods used in testing wheat and flour. Deposit, $2.50 per credit.

212. Milling Qualities of Wheat. 3(3-0); II. Prerequisite: Chem. 106. Dr. Swanson.
Factors which affect the milling qualities of wheat and the quality of flour, such as moisture, respiration, enzymes, harvesting, storage, climate, and soil.

FOR GRADUATE CREDIT

301. Milling Industry Research. 1 to 10 credits; I, II, and SS. Prerequisites: Mill. Ind. 205 and 206, and other courses required by the problem selected. Dr. Swanson, Dr. Working, and Mr. Pence.
A definite line of investigation which may, if sufficient as to quality and quantity, be used as a basis for a thesis presented in partial fulfillment of the requirements for the degree of Master of Science.

Poultry Husbandry

Professor Payne
Associate Professor Warren
Assistant Professor Steup
Graduate Assistant Kilpatrick
Superintendent Loomis

The poultry plant, occupying twenty-four acres and situated just north of the northeast corner of the College campus, is devoted to the breeding and rearing of the stock used for class and experimental work. It is equipped with various types of houses, runs, incubators and brooders, and with flocks of the leading breeds of fowls.

There is in the government and state experiment stations and in schools and colleges an increasing demand for men with experience and systematic training in handling poultry. There is likewise a growing demand for men to enter poultry-packing houses and for men capable of managing poultry-farming enterprises of considerable proportions.

The department owns equipment valued at $12,100.

COURSES IN POULTRY HUSBANDRY

FOR UNDERGRADUATE CREDIT

101. Farm Poultry Production. 2(1-3); I and II. Mr. Payne, Mr. Steup, and Mr. Kilpatrick.

Problems of poultry management on the general farm. Text: Lippincott, *Poultry Production* (Fourth edition). Charge, $2.

104. Practice in Poultry Feeding. 1(3 times a day, 7 days a week, for 3 weeks, at hours outside the regular schedule); II. Prerequisite: Poult. Husb. 101. Mr. Steup.

A flock of fowls cared for under supervision of an instructor; careful records kept of feeds consumed and eggs produced; survey of recent literature on poultry feeding. Charge, $2.

109. Poultry Judging. 3(1-6); I. Prerequisite: Poult. Husb. 101. Mr. Steup.

A historical study of the various breeds commonly found on the Kansas farm; particular attention to production characteristics and tracing evolution of present breed types.

Laboratory.—Judging the standard breeds and varieties by score card and by comparison; judging hens for egg production on the basis of their trap-nest records. Charge, $3.

116. Market Poultry and Eggs. 4(2-6); I. Prerequisite: Poult. Husb. 101. Mr. Payne and Mr. Kilpatrick.

Methods of handling market eggs and live dressed poultry.

Laboratory.—Candling and grading eggs; crate-feeding, killing, dressing, grading, and packing market poultry. Text: Benjamin, *Marketing Poultry Products.* Charge, $3.

120. Artificial Incubation and Brooding. 3(1-6) (laboratory 3 times a day, 7 days a week for not less than 8 weeks, at hours outside the regular schedule); II. Prerequisite: Poult. Husb. 101. Mr. Steup, and Mr. Kilpatrick.

Survey of the literature upon incubation and brooding; actual care of an incubator throughout the incubation period; bringing off the hatch; care of chicks in brooder for three weeks. Charge, $3.

125. Advanced Incubation. 1 credit (3 times a day, 7 days a week, for not less than 3 weeks, at hours outside the regular schedule); II. Prerequisites: Poult. Husb. 101 and 120. Mr. Payne and Mr. Kilpatrick.

Study of the baby chick industry; operation of a Mammoth incubator; packing and shipping of baby chicks. Charge, $2.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Poultry Breeding. 2(2-0); II. Prerequisite: An. Husb. 221. Dr. Warren.
Experimental work on inheritance in poultry is reviewed.

Poultry Farm Organization. See Advanced Farm Organization (Ag. Ec. 206A).

Poultry Bacteriology. See Poultry Bacteriology (Bact. 216).

Poultry Anatomy. See Special Anatomy (Anat. 201).

206. Poultry Problems. 1 to 5 credits; I, II, and SS. Prerequisites: Poult. Husb. 101, 104, and such other courses as required. Mr. Payne.
A definite investigation covering some phase of poultry work, to be continued into the next semester if necessary.

210. Genetics Seminar. 1 credit; the year. Prerequisites: Consult instructors. Dr. Nabours, Dr. Ibsen, Dr. Warren, and Dr. Parker.
Genetic experiments in plants and animals, the biological and mathematical methods employed, and validity of conclusions drawn.

215. Poultry Management. 2(2-0); II and SS. Prerequisites: Poult. Husb. 101; senior or graduate standing. Mr. Payne, and Mr. Steup.
A detailed study of all phases of farm and commercial flocks, including cost of production. Text: Rice and Botsford, *Practical Poultry Management.*

220. Poultry Seminar. 1(1-0); I. Prerequisite: Poult. Husb. 101. Required of all graduate students and of both juniors and seniors majoring in poultry husbandry. Dr. Warren.
A review of current literature appearing in periodicals and bulletins and reports on research projects and topics of special interest.

FOR GRADUATE CREDIT

301. Poultry Research. 1 to 10 credits; I, II, and SS. Prerequisites: Poult. Husb. 101, 104, 109, 116, 120, or their equivalent, and such other courses as required. Mr. Payne and Dr. Warren.
A definite line of investigation which may form the basis of a master's thesis.

Agriculture in the Summer School

Teachers in the high schools and grade schools of Kansas appreciate the value of the work offered in the Summer School of Kansas State Agricultural College. Besides first-class professional courses in education and other regular standard courses of college grade, courses in agriculture and agricultural engineering furnish unusual opportunities to teachers preparing for large usefulness in Kansas communities. Basic College courses are offered in most of the departments in the Division of Agriculture, and opportunity for graduate work is being broadened each year. This is especially true as regards graduate work provided for high school teachers of vocational agriculture. Brief information regarding many of these courses offered in the Summer School may be found in the department descriptions of courses in this catalogue. Further information may be secured by addressing a request to Dean of the Summer School, Kansas State Agricultural College, Manhattan, Kansas.

SPECIAL COURSES IN AGRICULTURE

The Farmer's Short Course and the Dairy Manufacturing Short Courses are discussed with other special courses in another part of this catalogue. They may be found by reference to the general index.

The Division of Engineering

Roy Andrew Seaton, *Dean.*

The Division of Engineering offers curricula in agricultural engineering, architectural engineering, architecture, chemical engineering, civil engineering, electrical engineering, flour mill engineering, landscape architecture, and mechanical engineering, each leading to the degree of Bachelor of Science in the profession selected.

While the curricula, as scheduled, are believed to be sufficient to cover the needs of the average young man, it is possible to combine portions of the work of two or more of them in such a way that one may be prepared to take up a special line of work for which he desires to fit himself. For example, by substituting certain courses from the departments of chemistry and geology for some of those in the curriculum in mechanical engineering, a young man can fit himself for work in connection with the oil industry. By combining some of the courses in civil and mechanical engineering and by taking additional work in chemistry and geology, a young man may fit himself for special work in connection with the development of the coal fields of the country. In special cases permission will be granted to combine the work on the lines here indicated. With the permission of the dean of the division students desiring to do so may substitute work in the reserve officers training corps for certain subjects in any of the curricula of the division.

It is believed that the curricula as tabulated give the best preparation for students expecting to follow general work in the profession selected and for those who are not certain what particular branch of the profession they will follow. The substitutions and combinations indicated, and others similar to them, will be permitted only when there is good evidence that the student desiring such work is practically certain to follow the branch selected.

In the case of any of these modifications, the degree granted will be that of the course in which the major portion of the work is taken. In no case will the substitution of an additional amount of technical work for any of the general cultural work in the course be allowed.

Besides the four-year professional curricula, the Division of Engineering offers one- or two-year courses in auto mechanics, blacksmithing, foundry practice, and machine shop work.

STATE TEACHER'S CERTIFICATE

By substituting nine specified credit hours of work in the Department of Education a four-year curriculum in engineering may lead not only to the degree of Bachelor of Science in Engineering, but at the same time qualify the student for a three-year Kansas state teacher's certificate, renewable for three-year periods. By taking nine additional credit hours of work in the Department of Education, graduates in engineering are qualified for the three-year Kansas state teacher's certificate, renewable for life and valid in any high school or any other public school in the state. A student desiring to qualify for teaching should begin his professional preparation by electing psychology in his junior year.

CURRICULUM IN AGRICULTURAL ENGINEERING

The curriculum in agricultural engineering is designed to qualify men for engineering work in rural communities; for positions in the farm-machinery and farm-motor industry; for the management of farms where drainage, irrigation or power-farming methods are prevalent; and for the positions of advisers, consulting engineers or architects in connection with agricultural development.

The work of the first year is similar to the other engineering curricula. During the last three years about one-fourth of the time is devoted to agricultural subjects, in order to familiarize the students with the modern methods of scientific agriculture and to enable them to apply engineering principles to agricultural problems. Considerable time is devoted to farm machinery, farm motors, rural architecture, highway engineering, irrigation, drainage, and concrete construction.

CURRICULUM IN ARCHITECTURAL ENGINEERING

The curriculum in architectural engineering as herein outlined is designed primarily for the student who wishes to specialize in the constructional side of the building profession.

The field of the architectural engineer is wide and varied. It comprises the superintending of building construction, general contracting, the estimating of costs for construction projects, and the designing of the structural members of steel, timber, and concrete.

Because of the nature of the work of the architectural engineer in the profession, it is necessary that he be also well grounded in the underlying principles of art and architectural design. In addition to the necessary architectural and engineering requirements the curriculum also provides for general cultural courses. These courses are designed to provide the student with the essentials of a liberal education.

CURRICULUM IN ARCHITECTURE

The curriculum in architecture aims to provide the technical training which will give a broad and sound foundation for the needs of the practicing architect, as well as the essentials of a liberal education. Although closely associated with, and somewhat dependent upon, science and engineering, architecture is primarily a fine art; hence the training of the architect, while including the general fundamentals of engineering and science, must be based primarily upon a study and understanding of the basic architectural principles together with the canons of art and good taste. A major portion of the curriculum is therefore devoted to the study of architectural design, supplemented by those subjects preparatory or contributory to it.

Supporting this line of study the student is given a comprehensive view of the development of civilization together with a more detailed study of the history of architecture and of art. Throughout the course draughtsmanship as applied to architectural design and construction, as well as to free-hand drawing and sketching, is given constant attention. Courses dealing with the fundamental principles of building construction, sanitation, heating, and lighting, together with a careful study of the properties and uses of building materials, are given simultaneously with the courses in design and drawing.

In addition to the above-outlined professional and technical studies, approximately one-quarter of the curriculum is devoted to more general studies designed to broaden the student's view and to give him the essentials of a liberal education. Thus it is the aim not only to provide a fundamental training upon which the student may base his professional development and advancement, but to afford a training which is in the broadest sense educational.

Students pursuing the curriculum in architecture are urged to devote a fifth year to the work. By so doing the student can combine the curricula in architectural engineering and architecture and receive the Bachelor of Science degree in both architectural engineering and architecture.

CURRICULUM IN CHEMICAL ENGINEERING

Though the progress of chemical science and of the chemical industries has been rapid in the last twenty-five years, their development really has only begun. One need but survey briefly the hosts of industries which are depend-

ent upon chemistry for their improvement to realize what opportunities await the trained chemical engineer. Industries which have been more or less empirically developed include those concerned with the manufacture of paints and varnishes, soaps, glass, leather, rubber, and ceramic materials. Industrial products which are the direct result of chemical research include dyes, synthetic essential oils, drugs, food products, and all electrochemical and electrothermal products, such as calcium carbide, carborundum, graphite, caustic soda, chlorine, chlorates, aluminum and other metals, and atmospheric nitrates. Still further improvements are possible in the present processes and a vast number of entirely new industries are waiting to be developed.

The training offered in the chemical engineering curriculum gives the student knowledge of the theoretical phases of chemistry and engineering which are fundamental to further development in many lines of industrial work. It is intended to fit him to enter the professional field of chemical engineering. In addition to sound training in chemical laws and processes, considerable work is given in the mathematical and physical sciences, drawing, economics, and engineering methods and operations.

CURRICULUM IN CIVIL ENGINEERING

The aim of the curriculum in civil engineering, as outlined in this catalogue, is to give the young men taking the work the best possible preparation for entering upon the active practice of the profession under present conditions. It will be noted that the first and second years are devoted largely to general cultural studies and the sciences, including mathematics. This follows the arrangement generally found in the engineering curricula of American colleges, and it finds its justification in the well-nigh universally accepted idea that any engineering education worthy of consideration must be grounded upon ample preliminary education in the allied sciences. An introduction to the technical work is given in these years through courses in drawing, shopwork, surveying, and the elementary phases of engineering.

The last two years are devoted largely to technical work. In recognition of the mechanical trend of the age, liberal provision is made for class and laboratory work in mechanical and electrical engineering. In view of the growing importance of municipal problems, such as paving, sewerage, and water supply, the curriculum in civil engineering includes required courses in these subjects.

Advanced elective courses in railway, highway, and irrigation and drainage engineering are offered in the second semester of the senior year.

CURRICULUM IN ELECTRICAL ENGINEERING

The essential elements underlying a sound engineering training are based upon a thorough study of mathematics and the physical sciences. These studies, together with introductory courses in drawing, shopwork, surveying, and the elementary phases of engineering, occupy most of the time of the first two years.

Freshmen are given courses which involve the fundamental principles of electricity and magnetism and their application to electrical construction and machinery.

The professional work of this curriculum begins in the junior year and continues throughout the last two years. General cultural subjects are included in the work of each of the four years.

Emphasis is placed upon training to deal with forces and matter according to scientific principles, rather than upon the accumulation of facts. The department laboratories are well equipped with the various measuring instruments, standardizing apparatus, and different types of dynamo machinery. The different subjects are presented in the classroom, and the classroom work is supplemented by laboratory practice. The curriculum provides a liberal training in wood- and iron-working, mechanical drawing, and machine-shop practice.

The laboratory experiments selected for the students are designed to give a clear conception of the theoretical work of the classroom.

Students are given extensive practice in connecting up the different types of machines for testing purposes and for standard commercial work. This practice work and testing extends throughout the junior and senior years, and is intended to give the student familiarity with the underlying principles of the different machines, and a knowledge of the care necessary to operate them successfully. Opportunity is also given to undertake the investigation of commercial problems as they are sent to the college from the different central stations of the state.

CURRICULUM IN FLOUR-MILL ENGINEERING

The milling of wheat and other cereals is an important industry in this state. The curriculum in flour-mill engineering is designed to prepare men for the management of mills, for work in connection with the designing of milling plants, and for research work in preparation and utilization of mill products.

The work of the freshman year is the same as in the other engineering courses. The sophomore year is similar to that of the mechanical engineering course, but includes additional chemistry and a beginning course in milling practice. In the junior and senior years, besides the courses dealing with the production, marketing, testing, and milling of grain products, a considerable amount of time is devoted to mechanics, chemistry, history, economics, steam and gas engineering, and flour-mill design.

CURRICULUM IN LANDSCAPE ARCHITECTURE

The aim of the curriculum in landscape architecture is to give to the student such technical training as will equip him for successful practice as a landscape architect.

The work of the landscape architect embraces the design, construction, execution, planting, and maintenance of farmsteads, estates, and other home grounds. In his work he is also called upon to plan parks, playgrounds, real estate subdivisions, country clubs, and boulevards and street systems. City planning and the laying out of town sites is probably the most important work of the landscape architect.

The function of the landscape architect is the fitting of land for human use, convenience, and enjoyment, whether it be in the city or in the country. The work requires a thorough knowledge of the fundamentals of architecture, engineering, and horticulture. Because landscape architecture is primarily a fine art, especial emphasis is given to the study of the fundamental principles of design. A major portion of the curriculum is therefore devoted to the study of architectural and landscape design. These courses are supplemented with courses in drafting, free-hand drawing, and sketching, so the student may develop a facility for expressing his ideas on paper. Throughout the course the student is also given intensive training in the study of plant materials, forestry, and soil conditions.

In addition to professional courses of study the curriculum provides general cultural courses. These courses are designed primarily to give the student the basic elements of a liberal education.

CURRICULUM IN MECHANICAL ENGINEERING

The work in mechanical engineering prepares for the successful management and superintendence of factories and power plants; for the design of power machinery installations; for the design and construction of machine tools, steam and gas engines, compressors, hydraulic machinery, etc.; and for the design and erection of engineering buildings and factories, including the selection, purchasing, and location of the equipment.

The curriculum has been laid out with the aim of securing a judicious mixture of theory and practice, such as will not only give the student the technical skill required for engineering operations, but will also endow him with an

understanding of the scientific and economic principles necessary for the solution of engineering and industrial problems.

Throughout the four years the theoretical studies in the classroom are supplemented by practical work in the laboratories in such a manner as very materially to strengthen both. In the testing laboratories the work does not end when the test is completed, but the entire problem must be written up in such a manner as would be approved in the best commercial testing laboratories. The laboratory work in the shops not only gives the student practice in performing the machinery and various mechanical operations, but includes a scientific study of the factors of production, so that the loss of material and expenditure of human effort will be a minimum.

Optional and elective courses are available in the senior year and give the student an opportunity for instruction in the more specialized branches of mechanical engineering.

Students pursuing a mechanical engineering curriculum are urged to spend at least two summers in some shop or commercial plant in order to broaden their training.

Curriculum in Agricultural Engineering

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)*	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry** Math. 101	3(3-0)	College Algebra** Math. 104	3(3-0)
College Rhetoric I Eng. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Mach. Design 101	2(0-6)	Descriptive Geometry Mach. Design 106	2(0-6)
Agricultural Machines and Construction Ag. Engr. 122	2(1-3)	Live Stock Judging An. Husb. 120	3(2-4)
Engineering Woodwork I Shop 101	1(0-3)	Forging I Shop 150	1(0-3)
Artillery I Mil. Tr. 113	1½(0-4)	Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	16½	Total	17½

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 205	5(5-0)
American Industrial History Hist. 105	3(3-0)	General Geology Geol. 103	3(3-0)
Mechanism Mach. Design 121	3(3-0)	Machine Drawing I Mach. Design 111	2(0-6)
Surveying I Civ. Engr. 102	2(0-6)	Surveying II Civ. Engr. 111	2(0-6)
Artillery III Mil. Tr. 115	1½(0-4)	Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	18½	Total	18½

* The number before the parenthesis indicates the number of semester hours of credit; the first number within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory each week.

** Students who offer but one unit of algebra for admission take a five-hour course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

JUNIOR

First Semester		Second Semester	
Applied Mechanics Ap. Mech. 202	4(4-0)	Strength of Materials Ap. Mech. 211, 220	6(5-3)
Calculus II Math. 206	3(3-0)	Farm Motors Ag. Engr. 125, 126	3(2-3)
Soils Agron. 130	4(3-3)	Farm Crops Agron. 101	4(2-6)
Field and Power Machinery Ag. Engr. 110	3(2-3)	Feeding Live Stock An. Husb. 172	3(3-0)
Extempore Speech I Pub. Spk. 106	2(2-0)		
Machine Tool Work I Shop 170	2(0-6)	Foundry Production Shop 161	1(0-3)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	17

SENIOR§

First Semester		Second Semester	
Economics Econ. 101	3(3-0)	Farm Organization Ag. Ec. 106	3(2-3)
Tractors and Trucks Ag. Engr. 116, 117	3(2-3)	Land Reclamation Ag. Engr. 150	3(2-3)
Farm Structures Ag. Engr. 104	3(1-6)	Rural Water Supply and Sewage Disposal Ag. Engr. 118	2(2-0)
Highway Engineering I Civ. Engr. 230 and Ap. Mech. 250	3(2-3)	Electrical Engineering C Elect. Engr. 160, 165	3(2-2, 1,
Hydraulics Ap. Mech. 230, 235	4(3-3)	Steam and Gas Engineering C Mech. Engr. 120, 125	3(2-3)
Business Law A Hist. 161	2(2-0)	Nontechnical Elective†	4(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	18

Number of semester hours required for graduation, 142.

Curriculum in Architectural Engineering

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Descriptive Geometry A Mach. Design 107	3(0-9)	Shades and Shadows, and Perspective Mach. Design 108	3(0-9)
Elements of Architecture I Arch. 106A	3(0-9)	Elements of Architecture II Arch. 107A	3(0-9)
Artillery I Mil. Tr. 113	1½(0-4)	Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	17½	Total	17½

§ Optional subjects are offered during the senior year for those wishing to specialize in rural electrification.

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Phys. 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
History of Architecture I Arch. 154A	2(2-0)	History of Architecture II Arch. 157A	2(2-0)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 205	5(5-0)
Object Drawing I Arch. 111	2(0-6)	Object Drawing II Arch. 114	2(0-6)
Extempore Speech I Pub. Spk. 106	2(2-0)	Electrical Machinery and Construction Elec. Engr. 170	2(0-6)
Surveying I Civ. Engr. 102	2(0-6)		
Artillery III Mil. Tr. 115	1½(0-4)	Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	18½	Total	17½

JUNIOR

First Semester		Second Semester	
Applied Mechanics Ap. Mech. 202	4(4-0)	Strength of Materials Ap. Mech. 211, 220	6(5-3)
Calculus II Math 206	3(3-0)	Working Drawings and Specifications Arch. 191	3(0-9)
History of Architecture III Arch. 158A	2(2-0)	History of Architecture IV Arch. 160A	2(2-0)
Masonry and Foundations Civ. Engr. 120	2(2-0)		
Design I Arch. 142	3(0-9)	Design II Arch 144	3(0-9)
Pencil Rendering and Sketching Arch. 116	2(0-6)	Water Color I Arch. 118	2(0-6)
Elective†	2(-)	Elective†	2(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	18

SENIOR

First Semester		Second Semester	
Stresses in Framed Structures Civ. Engr. 201	4(4-0)	Design of Framed Structures Civ. Engr. 246	3(0-9)
Civil Engineering Drawing II Civ. Engr. 205	2(0-6)	Concrete Design Civ. Engr. 250, 255	3(2-3)
Design III Arch. 145	5(0-15)	Design IV Arch. 147	5(0-15)
Rural Architecture Arch. 153	2(0-6)	Steam and Gas Engineering C Mech. Engr. 120, 125	3(2-3)
Economics Econ. 101	3(3-0)	Business Management Econ. 126	2(2-0)
Business Law A Hist. 161	2(2-0)	Elective†	2(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	18

Number of semester hours required for graduation, 143.

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

Curriculum in Architecture

FRESHMAN

First Semester		Second Semester	
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
History of Architecture I Arch. 154A	2(2-0)	History of Architecture II Arch. 157A	2(2-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Descriptive Geometry A Mach. Design 107	3(0-9)	Shades and Shadows, and Perspective Mach. Design 108	3(0-9)
Object Drawing I Arch. 111	2(0-6)	Object Drawing II Arch. 114	2(0-6)
Elements of Architecture I Arch. 106A	3(0-9)	Elements of Architecture II Arch. 107A	3(0-9)
Artillery I Mil. Tr. 113	1½(0-4)	Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M (Men) Phys. Ed. 103	R(0-2) *or*	Physical Education M (Men) Phys. Ed. 104	R(0-2) *or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total, men	17½	Total, men	17½
Total, women	16	Total, women	16

SOPHOMORE

First Semester		Second Semester	
General Physics I Physics 135	4(3-3)	General Physics II Physics 140	4(3-3)
History of Architecture III Arch. 158A	2(2-0)	History of Architecture IV Arch. 160A	2(2-0)
Building Materials and Construction Arch. 187A	3(3-0)	Working Drawings and Specifications Arch. 191	3(0-9)
Pencil Rendering and Sketching Arch. 116	2(0-6)	Water Color I Arch. 118	2(0-6)
Design I Arch. 142	3(0-9)	Design II Arch. 144	3(0-9)
French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 152	3(3-0)
Artillery III Mil. Tr. 115	1½(0-4)	Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M (Men) Phys. Ed. 105	R(0-2) *or*	Physical Education M (Men) Phys. Ed. 106	R(0-2) *or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
Total, men	18½	Total, men	18½
Total, women	17	Total, women	17

JUNIOR

First Semester		Second Semester	
Applied Mechanics A Ap. Mech. 102	3(3-0)	Strength of Materials A Ap. Mech. 116, 121	4(3-3)
Still Life Drawing Arch. 117	2(0-6)	Life Drawing I Arch. 121	2(0-6)
Design III Arch. 145	5(0-15)	Design IV Arch. 147	5(0-15)
Rural Architecture Arch. 153	2(0-6)	Extempore Speech I Pub. Spk. 106	2(2-0)
Economics Econ. 101	3(3-0)	Business Law A Hist. 161	2(2-0)
History of Civilization and Art I Arch. 178	2(3-0)	History of Civilization and Art II Arch. 182	2(3-0)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	17	Total	17

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

SENIOR

First Semester		Second Semester	
Interior Design Arch. 120	2(0-6)	Life Drawing II Arch. 123	2(0-6)
Design V Arch 253	8(0-24)	Design VI Arch. 256	8(0-24)
Theory of Structures I Arch. 192	4(2-6)	Theory of Structures II Arch. 194A	5(3-6)
Elective†	4(-)	Elective†	2(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	17

Number of semester hours required for graduation: Men, 141; women, 135

Curriculum in Chemical Engineering

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Mach. Des. 101	2(0-6)	Descriptive Geometry Mach. Des. 106	2(0-6)
Extempore Speech I Pub. Spk. 106	2(2-0)	Machine Drawing I Mach. Des. 111	2(0-6)
Engineering Woodwork I Shop 101	1(0-3)	Metallurgy Shop 165	2(2-0)
Forging I Shop 150	1(0-3)		
Artillery I Mil. Tr. 113	1½(0-4)	Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	17½	Total	17½

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 205	5(5-0)
Adv. Inorg. Chemistry Chem. 207	3(3-0)	Quantitative Analysis Chem. 241	5(1-12)
Inorganic Preparations Chem. 202	2(0-6)	Metallography Shop 167	1(0-3)
American Industrial History Hist. 105	3(3-0)	Library Methods Lib. Ec. 101	1(1-0)
Artillery III Mil. Tr. 115	1½(0-4)	Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	18½	Total	18½

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

JUNIOR

First Semester		Second Semester	
Calculus II Math. 206	3(3-0)	Strength of Materials E Ap. Mech. 216, 220	4(3-3)
Applied Mechanics Ap. Mech. 202	4(4-0)	Industrial Electrochemistry Chem. 205	2(2-0)
Steam and Gas Engineering I Mech. Engr. 101, 105§	5(4-3)	Steam and Gas Engineering II Mech. Engr. 110, 115§	4(3-3)
Organic Chemistry I Chem. 218	4(2-6)	Organic Chemistry II Chem. 219	4(2-6)
Gas Analysis Chem. 243	1(0-3)	Economics Econ. 101	3(3-0)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	17	Total	17

SENIOR

First Semester		Second Semester	
Industrial Chemistry I Chem. 203	5(3-6)	Industrial Chemistry II Chem. 204	5(3-6)
Electrical Engineering M-I Elect. Engr. 230, 231§	4(3-2, 1)	Electrical Engineering M-II Elect. Engr. 242, 243§	4(3-2, 1)
Physical Chemistry Chem. 206	5(3-6)	History of Chemistry Chem. 208	1(1-0)
Organic Preparations Chem. 223	2(0-6) *or*	Nontechnical electives†	7(-)
Qualitative Organic Analysis Chem. 224	2(0-6)		
Fire Assaying Chem. 242	2(0-6)		
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	17

Number of semester hours required for graduation, 141.

§ Students who wish to do so may replace these courses with German I (3 semester hours), German II (3 semester hours), Scientific German (4 semester hours), Steam and Gas Engineering C (3 semester hours), Electrical Engineering C (3 semester hours), and Elective (1 semester hour).

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

Curriculum in Civil Engineering

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Mach. Design 101	2(0-6)	Descriptive Geometry Mach. Design 106	2(0-6)
Surveying I Civ. Engr. 102	2(0-6)	Surveying II Civ. Engr. 111	2(0-6)
Extempore Speech I Pub. Spk. 106	2(2-0)	Engineering Woodwork I Shop 101	1(0-3)
		Forging I Shop 150	1(0-3)
Artillery I Mil. Tr. 113	1½(0-4)	Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	17½	Total	17½

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 205	5(5-0)
American Industrial History Hist. 105	3(3-0)	Metallurgy Shop 165	2(2-0)
Surveying III Civ. Engr. 151, 155	3(2-3)	Surveying IV Civ. Engr. 156, 157	3(2-3)
Machine Drawing I Mach. Design 111	2(0-6)	Civil Engineering Drawing I Civ. Engr. 125	2(0-6)
Artillery III Mil. Tr. 115	1½(0-4)	Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	18½	Total	18½

JUNIOR

First Semester		Second Semester	
Applied Mechanics Ap. Mech. 202	4(4-0)	Strength of Materials Ap. Mech. 211, 220	6(5-3)
Calculus II Math. 206	3(3-0)	Hydraulics Ap. Mech. 230, 235	4(3-3)
Highway Engineering I Civ. Engr. 230 and Ap. Mech. 250	3(2-3)	Railway Engineering I Civ. Engr. 145	2(2-0)
Masonry and Foundations Civ. Engr. 120	2(2-0)	Drainage and Irrigation I Civ. Engr. 161	2(2-0)
Economics Econ. 101	3(3-0)	Steam and Gas Engineering C Mech. Engr. 120, 125	3(2-3)
Business Law A Hist. 161	2(2-0)		
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	17	Total	17

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

SENIOR

First Semester		Second Semester	
Stresses in Framed Structures Civ. Engr. 201	4(4-0)	Design of Framed Structures Civ. Engr. 246	3(0-9)
Civil Enginering Drawing II Civ. Engr. 205	2(0-6)	Electrical Engineering C Elect. Engr. 160, 165	3(2-2, 1)
Astronomy and Geodesy Civ. Engr. 211, 216	4(2-6)	Engineering English Engl. 110	2(2-0)
Water Supply Civ. Engr. 220	2(2-0)	Business Management Econ. 126	2(2-0)
Sewerage Civ. Engr. 225	2(2-0)	Concrete Design Civ. Engr. 250, 255	3(2-3)
		Railway Engineering II Civ. Engr. 260, 265	4(2-6) *or*
Engineering Geology Geol. 102	4(3-3)	Highway Engineering II Civ. Engr. 270, 275	4(2-6) *or*
		Drainage and Irrigation II Civ. Engr. 280, 285	4(2-6)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	17

Number of semester hours required for graduation, 141.

Curriculum in Electrical Engineering

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Mach. Design 101	2(0-6)	Descriptive Geometry Mach. Design 106	2(0-6)
Engineering Woodwork I Shop 101	1(0-3)	Extempore Speech I Pub. Spk. 106	2(2-0)
Forging I Shop 150	1(0-3)		
Electrical Machinery and Construction Elect. Engr. 170	2(0-6) *or*	Electrical Machinery and Construction Elect. Engr. 170	2(0-6) *or*
Surveying I Civ. Engr. 102	2(0-6)	Surveying I Civ. Engr. 102	2(0-6)
Artillery I Mil. Tr. 113	1½(0-4)	Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	17½	Total	17½

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 205	5(5-0)
Mechanism Mach. Design 121	3(3-0)	American Industrial History Hist. 105	3(3-0)
Machine Drawing I Mach. Design 111	2(0-6)	Machine Drawing E-II Mach. Design 117	2(0-6)
Metallurgy Shop 165	2(2-0) *or*		
Principles of Electrical Engineering Elect. Engr. 179	2(2-0)	Principles of Electrical Engineering Elect. Engr. 179	2(2-0) *or*
Foundry Production Shop 161	1(0-3)	Metallurgy Shop 165	2(2-0)
Artillery III Mil. Tr. 115	1½(0-4)	Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	18½	Total	18½

JUNIOR

First Semester		Second Semester	
Steam and Gas Engineering I Mech. Engr. 101, 105	5(4-3)	Steam and Gas Engineering II Mech. Engr. 110, 115	4(3-3)
Calculus II Math. 206	3(3-0)	Applied Mechanics Ap. Mech. 202	4(4-0)
Direct-current Machines I Elect. Engr. 203, 204	4(3-2, 1)	Direct-current Machines II Elect. Engr. 206, 207	3(2-2, 1)
Electrical Measurements Elect. Engr. 227, 228	3(2-3)	Alternating-current Machines I Elect. Engr. 209, 211	5(4-2, 1)
Economics Econ. 101	3(3-0)	Electrical Machine Design I Elect. Engr. 270	1(0-3)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	17

SENIOR

First Semester		Second Semester	
Strength of Materials E Ap. Mech. 216, 220	4(3-3)	Machine Tool Work I Shop 170	2(0-6)
Hydraulics Ap. Mech. 230, 235	4(3-3)		
Alternating-current Machines II Elect. Engr. 214, 216	4(3-3)	Alternating-current Machines III Elect. Engr. 224, 225	5(3-6)
		Nontechnical elective†	6(-)
Elective†	5(-)	Elective†	4(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	17	Total	17

Number of semester hours required for graduation, 141.

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

Curriculum in Flour-mill Engineering

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Extempore Speech I Pub. Spk. 106	2(2-0)		
Engineering Drawing Mach. Design 101	2(0-6)	Descriptive Geometry Mach. Design 106	2(0-6)
Engineering Woodwork I Shop 101	1(0-3)	Principles of Milling I Mill. Ind. 104	2(1-3)
Forging I Shop 150	1(0-3)	Surveying I Civ. Engr. 102	2(0-6)
Artillery I Mil. Tr. 113	1½(0-4)	Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	17½	Total	17½

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Phys. 145	5(4-3)	Engineering Physics II Physics 150	5 (4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 205	5(5-0)
Elementary Organic Chemistry Chem. 123	3(2-3)	Mechanism Mach. Design 121	3(3-0)
Machine Drawing I Mach. Design 111	2(0-6)	Machine Drawing II Mach. Design 116	3(0-9)
Quantitative Analysis A Chem. 250	3(1-6)	Principles of Milling II Mill. Ind. 106	1(0-3)
Artillery III Mil. Tr. 115	1½(0-4)	Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	18½	Total	18½

JUNIOR

First Semester		Second Semester	
Applied Mechanics Ap. Mech. 202	4(4-0)	Strength of Materials E Ap. Mech. 216, 220	4(3-3)
Calculus II Math. 206	3(3-0)	Economics Econ. 101	3(3-0)
Advanced Quantitative Analysis Chem. 260	1(0-3)	Grain Grading and Judging Agron. 108	2(0-6)
American Industrial History Hist. 105	3(3-0)	Milling Qualities of Wheat Mill. Ind. 212	3(3-0)
Farm Crops Laboratory Agron. 101	2(0-6)		
Milling Practice I Mill. Ind. 109	3(1-6)	Milling Practice II Mill. Ind. 111	3(1-6)
Milling Entomology Ent. 116	1(1-0)	Machine Tool Work I Shop 170	2(0-6)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	17	Total	17

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

SENIOR

First Semester		Second Semester	
Wheat and Flour Testing Mill. Ind. 205	3(0-9)	Experimental Baking A Mill. Ind. 206	3(1-6)
Grain Marketing Ag. Ec. 203	3(3-0)	Electrical Engineering C Elect. Engr. 160, 165	3(2-2, 1)
Flow Sheet Design Mach. Des. 214	2(0-6)	Flour-mill Design Mach. Design 215	2(0-6)
Milling Technology I Mill. Ind. 201	2(0-6)	Milling Technology II Mill. Ind. 202	2(0-6)
Steam and Gas Engineering I Mech. Engr. 101, 105	5(4-3)	Steam and Gas Engineering II Mech. Engr. 110, 115	4(3-3)
Elective†	3(-)	Elective†	4(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	18

Number of semester hours required for graduation, 142.

Curriculum in Landscape Architecture

FRESHMAN

First Semester		Second Semester	
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Descriptive Geometry A Mach. Design 107	3(0-9)	Shades and Shadows, and Perspective Mach. Design 108	3(0-9)
Object Drawing I Arch. 111	2(0-6)	Object Drawing II Arch. 114	2(0-6)
Surveying I Civ. Engr. 102	2(0-6)	Surveying II Civ. Engr. 111	2(0-6)
Artillery I (Men) Mil. Tr. 113	1½(0-4)	Artillery II (Men) Mil. Tr. 114	1½(0-4)
Physical Education M (Men) Phys. Ed. 103	R(0-2) *or*	Physical Education M (Men) Phys. Ed. 104	R(0-2) *or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Total, men	17½	Total, men	17½
Total, women	16	Total, women	16

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

SOPHOMORE

First Semester		Second Semester	
History of Architecture I Arch. 154A	2(2-0)	History of Architecture II Arch. 157A	2(2-0)
Elements of Architecture I Arch. 106A	3(0-9)	Elements of Architecture II Arch. 107A	3(0-9)
Surveying III Civ. Engr. 151, 155	3(2-3)	Water Color I Arch. 118	2(0-6)
General Chemistry Chem. 110	5(3-6)	Plant Ecology Bot. 228	2(2-0)
Landscape Gardening I Hort. 125	3(3-0)	Elements of Horticulture Hort. 107	3(2-3)
		General Geology Geol. 103	3(3-0)
Artillery III (Men) Mil. Tr. 115	1½(0-4)	Artillery IV (Men) Mil. Tr. 116	1½(0-4)
Physical Education M (Men) Phys. Ed. 105	R(0-2) *or*	Physical Education M (Men) Phys. Ed. 106	R(0-2) *or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
		Elective†	1(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total, men	17½	Total, men	17½
Total, women	16	Total, women	16

JUNIOR

First Semester		Second Semester	
History of Architecture III Arch. 158A	2(2-0)	History of Architecture IV Arch. 160A	2(2-0)
Pencil Rendering and Sketching Arch. 116	2(0-6)	Silviculture Hort. 119	3(2-3)
Design I Arch. 142	3(0-9)	Design II Arch. 144	3(0-9)
Building Materials and Construction Arch. 187A	3(3-0)	Plant Materials II Hort. 226	3(1-6)
Theory of Landscape Design Hort. 243	2(2-0)	Working Drawings and Specifications Arch. 191	3(0-9)
Plant Materials I Hort. 224	3(2-3)	Soils Agron. 130	4(3-3)
Plant Physiology I Bot. 208	3(3-0)		
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	18

SENIOR

First Semester		Second Semester	
Landscape Construction Hort. 227	3(2-3)	Civic Art Hort. 223	3(1-6)
Greenhouse Construction and Management Hort. 128	3(3-0)	Landscape Gardening III Hort. 246	3(1-6)
Highway Engineering I Civ. Engr. 230 and Ap. Mech. 250	3(2-3)	City Planning Arch. 249	3(0-9)
Rural Architecture Arch. 153	2(0-6)	Economics Econ. 101	3(3-0)
Landscape Gardening II Hort. 238	3(1-6)		
Plant Pathology I Bot. 205	3(1-4, 2)	Elective	6(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	17	Total	18

Number of semester hours required for graduation: Men, 141; women, 135.

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

Curriculum in Mechanical Engineering

FRESHMAN

First Semester

Chemistry E-I Chem. 107	4(3-3)
Plane Trigonometry‡ Math. 101	3(3-0)
College Rhetoric I Engl. 101	3(3-0)
Engineering Drawing Mach. Design 101	2(0-6)
Extempore Speech I Pub. Spk. 106	2(2-0)
Engineering Woodwork I Shop 101 *or* Forging I Shop 150	1(0-3)
Elements of Steam and Gas Power Mech. Engr. 130	2(0-6)
Artillery I Mil. Tr. 113	1½(0-4)
Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 103	R(0-2)
Total	17½

Second Semester

Chemistry E-II Chem. 108	4(3-3)
College Algebra‡ Math. 104	3(3-0)
College Rhetoric II Engl. 104	3(3-0)
Descriptive Geometry Mach. Design 106	2(0-6)
Surveying I Civ. Engr. 102	2(0-6)
Elements of Steam and Gas Power Mech. Engr. 130 *or* Engineering Woodwork I Shop 101 / Forging I Shop 150	2(0-6) *or* 1(0-3) / 1(0-3)
Artillery II Mil. Tr. 114	1½(0-4)
Engineering Lectures Gen. Engr. 101	R
Physical Education M Phys. Ed. 104	R(0-2)
Total	17½

SOPHOMORE

First Semester

Engineering Physics I Physics 145	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)
Mechanism Mach. Design 121	3(3-0)
Machine Drawing I Mach. Design 111	2(0-6)
Metallurgy Shop 165	2(2-0)
Metallography Shop 167	1(0-3)
Artillery III Mil. Tr. 115	1½(0-4)
Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 105	R(0-2)
Total	18½

Second Semester

Engineering Physics II Phys. 150	5(4-3)
Calculus I Math. 205	5(5-0)
American Industrial History Hist. 105	3(3-0)
Machine Drawing II Mach. Design 116	3(0-9)
Foundry Production Shop 161	1(0-3)
Artillery IV Mil. Tr. 116	1½(0-4)
Seminar Gen. Engr. 105	R
Physical Education M Phys. Ed. 106	R(0-2)
Total	18½

JUNIOR

First Semester

Applied Mechanics Ap. Mech. 202	4(4-0)
Calculus II Math. 206	3(3-0)
Steam and Gas Engineering I Mech. Engr. 101, 105	5(4-3)
Machine Tool Work I Shop 170	2(0-6)
Economics Econ. 101	3(3-0)
Seminar Gen. Engr. 105	R
Total	17

Second Semester

Strength of Materials Ap. Mech. 211, 220	6(5-3)
Graphic Statics Ap. Mech. 225	1(0-3)
Steam and Gas Engineering II Mech. Engr. 110, 115	4(3-3)
Machine Tool Work II Shop 192	2(0-6)
Nontechnical Elective†	4(-)
Seminar Gen. Engr. 105	R
Total	17

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

SENIOR

First Semester		Second Semester	
Electrical Engineering M-I Elect. Engr. 230, 231	4(3-2, 1)	Electrical Engineering M-II Elect. Engr. 242, 243	4(3-2, 1)
Power Plant Engineering Mech. Engr. 206	3(0-9)	Refrigeration, Heating and Ventilation Mech. Engr. 210, 215	3(2-3)
Machine Design I Mach. Design 204, 205	5(3-6)	Machine Design II Mach. Design 210	2(0-6)
Hydraulics Ap. Mech. 230, 235	4(3-3)	Commercial Engineering Elect. Engr. 250	2(2-0)
Factory Option:		*Factory Option:*	
Factory Engineering Shop 245A	2(2-0)	Factory Design Shop 255	2(0-6)
		Machine Tool Work III Shop 193	1(0-3)
		Elective†	3(-)
Power Option:		*Power Option:*	
Advanced Thermodynamics Mech. Engr. 230	2(2-0)	Steam Turbines Mech. Engr. 235	2(2-0)
		Elective†	4(-)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Total	18	Total	17

Number of semester hours required for graduation, 141.

Agricultural Engineering

Professor Walker
Associate Professor Sanders
Associate Professor Driftmier
Instructor Bainer
Instructor Gordon
Assistant Smith

This department gives instruction in such branches of engineering as are directly related to agriculture. It also correlates and gives general supervision to such courses presented in other engineering departments as are open to students in agriculture and agricultural engineering, in order that the agricultural application and uses of engineering principles, methods, and materials may be kept clearly before the student.

In all the courses given, the time is carefully apportioned between the classroom and the laboratory, in order to present the subject in the clearest and most forceful way. The practical application of theoretical principles is emphasized.

The laboratory equipment is unusually ample and complete; all kinds of modern farm implements and equipment, to the value of $30,000, are available, hence their construction, operation, adjustment, and care may be fully covered in the field and laboratory studies. The study of traction engines is arranged to cover thoroughly the construction, operation and repair of the numerous modern tractors which are part of the regular equipment; traction tests in conjunction with various types of farm power machinery are also made. The tractor laboratory is equipped with four tractor power units mounted on bases, with various types of tractor ignition apparatus, and with complete apparatus for power and draft tests. All farm machinery and tractor equipment is kept up to date through a system of exchange with the manufacturers whereby old machines are replaced, when advisable, by new ones.

The comparatively recent development of this work, and its rapidly growing importance, render investigational study very valuable, and special attention is given to the courses covering this phase of the subject.

The department possesses equipment valued at $8,926.

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

COURSES IN AGRICULTURAL ENGINEERING

FOR UNDERGRADUATE CREDIT

103. Farm Buildings. 3(1-6)*; II and SS. Mr. Walker and assistants.
Requirements, details of arrangements, and materials of construction for barns, storage, and work buildings for the farm; preparation of specifications, bills of material, and estimates of costs. Text: Foster and Carter, *Farm Buildings.*

104. Farm Structures. 3(1-6); I. Prerequisite: Applied Mechanics (Ap. Mech. 202). Mr. Walker and assistants.
Design of farm structures, details and materials of construction; specifications and estimates. Text: Foster and Carter, *Farm Buildings.*

108. Field and Power Machinery C. 3(2-3); I. Mr. Driftmier and assistants.
Construction, operation and use of tillage, seeding, harvesting and miscellaneous farm machinery operated by animal and mechanical power. Text: Kranich, *Farm Equipment.* Charge, $2.

110. Field and Power Machinery. 3(2-3); I. Prerequisites: Mechanism (Mach. Des. 121), Engineering Physics II (Phys. 150). Mr. Driftmier and assistants.
Development, design, construction and utilization of tillage, seeding and harvesting machinery for all forms of farm power. Text: Kranich, *Farm Equipment,* and references. Charge, $2.

116, 117.† Tractors and Trucks. 3(2-3); I. Prerequisites: Farm Motors (Ag. Engr. 125, 126). Mr. Sanders and assistants.
Principles of construction, operation, and application of tractors and trucks to agriculture. Text: Schaefer, *Motor Truck, Design and Construction.* Charge, $2.

118. Rural Water Supply and Sewage Disposal. 2(2-0); II. Prerequisites: General Geology (Geol. 103), Hydraulics (Ap. Mech. 230, 235). Mr. Walker and assistants.
The development, storage, distribution, and purification of rural water supplies, and the collection and disposal of farm and rural wastes.

119. Farm Sanitation and Water Supply. 2(2-0); II. Prerequisite: General Geology (Geol. 103). Mr. Walker and assistants.
Development of water supplies for the farm, water contamination, water systems, household sewage disposal, collection of farm wastes, and sanitary arrangement of farm buildings.

120, 121. Farm Equipment. 2(1-3); II. Mr. Driftmier and assistants.
Basic principles of mechanics, farm construction methods, farm survey and lighting, water and sewage disposal systems. Text: Ramsower, *Equipment for the Farm and Farmstead.* Charge, $1.

122. Agricultural Machines and Construction. 2(1-3); II. Mr. Driftmier and assistants.
Introductory principles of mechanics and physics as applied to agricultural equipment. Charge, $1.

125, 126. Farm Motors. 3(2-3); II. Prerequisites: Engineering Physics II (Phys. 150), Calculus I (Math. 205). Mr. Sanders and assistants.

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* The number before the parenthesis indicates the number of semester hours of credit; the first numeral within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week. I, II, and SS indicate that the course is given the first semester, second semester, and summer session, respectively.

† In the case of many of the engineering courses, one course number is used for the recitation and another for the laboratory part of the course.

Theory, design, and construction of internal combustion engines adapted to agricultural uses. Text: Huebotter, *Mechanics of the Gasoline Engine.* Charge, $2.

130. Gas Engines and Tractors. 3(2-3); I and SS. Mr. Sanders and assistants.

Principles and application of the internal combustion engine, engine mechanisms, carburetion, valve timing, cooling, lubrication and ignition. Text: Fraser and Jones, *Motor Vehicles and Their Engines.* Charge, $2.

140, 145. Elements of Irrigation and Drainage. 3(2-3); I. Prerequisite: Soils (Agron. 133). Mr. Walker and assistants.

The fundamental principles of land reclamation by drainage and irrigation, with special reference to agricultural development. Texts: Elliott, *Engineering for Land Drainage,* and Fortier, *Use of Water in Irrigation.* Charge, $1.

150. Land Reclamation. 3(2-3); II. Prerequisites: Hydraulics (Ap. Mech. 230, 235), Soils (Agron. 133). Mr. Walker and assistants.

Principles and methods of bringing waste lands into production by drainage, irrigation, terracing and land clearing. Texts: Elliott, *Engineering for Land Drainage,* and Fortier, *Use of Water in Irrigation.* Charge, $1.

FOR GRADUATE AND UNDERGRADUATE CREDIT

205. Farm Machinery Research. 2(0-6) to 5(0-15); II. Prerequisites: Field and Power Machinery (Agr. Engr. 110), such other courses as required, and permission of instructors. Mr. Walker, Mr. Driftmier, and Mr. Bainer.

Original investigations along the lines of draft requirements, power consumption, or operation of farm machinery.

215. Tractor Research. 2(0-6) to 5(0-15); I. Prerequisites: Tractors and Trucks (Agr. Engr. 116, 117), and such other courses as required. Mr. Sanders and Mr. Driftmier.

Research studies relating to tractor construction and operation.

FOR GRADUATE CREDIT

301. Agricultural Engineering Research. 1 to 10 credits; I and II. Prerequisites: Soils (Agron. 133), and Engineering Physics II (Physics 150) or equivalent. Mr. Walker.

The laboratories of the College are available for research in the design, use, and application of machinery and equipment in the development of agriculture. The results of such investigations, if suitable, may be incorporated in bulletins of the Engineering Experiment Station, or the work may furnish material for the master's thesis.

Applied Mechanics

Professor Scholer
Professor Robert
Associate Professor Wojtaszak
Associate Professor Dawley
Associate Professor Allen
Associate Professor Spieth
Assistant Professor Cheek

The aim of the course in applied mechanics is to give to the engineering student a practical working knowledge of those fundamental principles of mechanics upon which his future work in structural and machine design may be based.

The materials-testing laboratory is well equipped with machines and apparatus for making physical tests of materials of construction, such as tension, compression, flexure, shear, torsion, hardness, and impact tests, and tests under repeated load. Some of the machines are of sufficient capacity to test full size structural and machine members to destruction, among them being a universal machine of 200,000 pounds capacity, with extension members for testing long beams and columns. Facilities are provided for making, curing, and testing concrete and reinforced concrete test specimens.

The materials-testing laboratory also has complete equipment for the testing of highway materials, and has been designated as the official laboratory of the Kansas Highway Commission.

The hydraulics laboratory has facilities for furnishing water under a considerable range of pressures and volumes. It contains devices for measuring and recording the flow of water, including measuring pits, water meters, weirs, nozzles, pitometer, and a Venturi meter. It is also provided with pumps, a standpipe, water motors, and a turbine water wheel for testing purposes, and a supply of pressure gauges, weighing scales, and other auxiliary apparatus. The equipment belonging to the department is valued at $30,036.

COURSES IN APPLIED MECHANICS

FOR UNDERGRADUATE CREDIT

102. Applied Mechanics A. 3(3-0); I. Prerequisites: Plane Trigonometry and Engineering Physics I. Mr. Robert and Mr. Cheek.

A study of statics, with applications to stresses in structures; center of gravity; and moment of inertia.

116. Strength of Materials A Recitation. 3(3-0); II. Prerequisite: Applied Mechanics A. Mr. Robert and Mr. Cheek.

Behavior of materials subjected to tension, compression, and shear; strength and stiffness of simple beams; moment and shear in flexure of beams, with diagrams; designs of beams of wood, steel and reinforced concrete, and design and investigation of columns.

121. Strength of Materials A Laboratory. 1(0-3); II. Prerequisites: Applied Mechanics A. Mr. Robert and Mr. Cheek.

A study of various testing machines; tension, compression, shear, and bending tests on iron, steel, wood, and concrete; tests on cement and on the fine and coarse aggregates for concrete. Charge, $2.

150. Thesis. 1(0-3), I; and 2(0-6), II. Mr. Scholer and Mr. Robert.

An excellent opportunity for experimental work in strength of materials, road materials, concrete and hydraulics, suitable for thesis projects in any branch of engineering; subject of investigation to be selected in consultation with the head of the department at the beginning of the senior year.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Applied Mechanics. 4(4-0); I, II, and SS. Prerequisites: Calculus I and Engineering Physics II. Mr. Scholer, Mr. Robert and Mr. Spieth.

Composition, resolution, and conditions of equilibrium of concurrent and nonconcurrent forces; center of gravity; friction; laws of rectilinear and curvilinear motion of material points; moments of inertia; relations between forces acting on rigid bodies and the resulting motions; and of work, energy, and power. Text: Poorman, *Applied Mechanics.*

211. Strength of Materials Recitation. 5(5-0); I, II and SS. Prerequisite: Applied Mechanics. Mr. Scholer, Mr. Robert, Mr. Wojtaszak.

Behavior of materials subjected to tension, compression, and shear; riveted joints; torsion; shafts, and the transmission of power; strength and stiffness of simple and continuous beams; bending moments and shear forces in beams; design of beams; stresses in columns and hooks; and the design of columns. Text: Boyd, *Strength of Materials,* and Sutherland and Clifford, *Reinforced Concrete Design.* Carnegie, *Pocket Companion,* used for reference.

216. Strength of Materials E Recitation. 3(3-0); I, II, and SS. Prerequisite: Applied Mechanics. Mr. Robert and Mr. Dawley. Similar to course 211, but much less time given to study of continuous girders and of reinforced concrete. Text: Boyd, *Strength of Materials.* Carnegie, *Pocket Companion,* used for reference.

220. Strength of Materials Laboratory. 1(0-3); I, II, and SS. Must

accompany or follow course 211 or 216. Mr. Robert, Mr. Spieth, Mr. Dawley, and Mr. Allen.

Tension, compression, shear, and bending tests on specimens of iron, steel, wood and concrete; torsion tests on steel shafting; standard tests on fine and coarse aggregates for concrete. Text: Hatt and Schofield, *Laboratory Manual for Testing Materials.* Charge, $2.

225. Graphic Statics. 1(0-3); II. Must accompany or follow course 102 or 202. Mr. Robert.

Graphical solutions of the stresses existing in a number of typical trusses, under a variety of loadings. Text: Hudson and Squire, *Elements of Graphic Statics.*

230. Hydraulics Recitation. 3(3-0); I, II, and SS. Prerequisite: Applied Mechanics. Mr. Robert, Mr. Spieth and Mr. Wojtaszak.

Fluid pressures, center of pressure, immersion and flotation; Bernoulli's theorem; orifices, weirs, short and long pipes; flow of water in open channels, and its measurement; elements of water power, impulse, wheels, reaction turbines, and centrifugal pumps. Text: Daugherty, *Hydraulics.*

235. Hydraulics Laboratory. 1(0-3). I, II, and SS. Prerequisite: Applied Mechanics. Mr. Robert, Mr. Spieth, and Mr. Wojtaszak.

Tests to determine the coefficients of weirs and orifices, loss of head in pipes, water wheels, water turbines, rams, and pumps, also use and calibration of water meters. Charge, $1.

250. Highway Engineering I Laboratory. 1(0-3); I. Prerequisite: Strength of Materials Laboratory. Mr. Scholer and Mr. Allen.

A comprehensive course in the examination and testing of road materials. Text: Blanchard, *Highway Engineer's Handbook.* Charge, $1.50.

260. Advanced Applied Kinetics. 2(2-0); II. Prerequisite: Strength of Materials or Strength of Materials E. Mr. Robert.

Advanced problems in kinetics with special attention to kinetics of rigid bodies.

265. Advanced Mechanics of Materials. 2(2-0); I. Prerequisite: Strength of Materials. Mr. Scholer.

Theory of elasticity and its applications; advanced problems in continuous girders involving general three-moment equations.

270. Hydraulic Machinery. 2(2-0); I. Prerequisite: Hydraulics. Mr. Robert.

Characteristics and applications of water wheels, turbines, pumps, and other hydraulic machinery.

275. Road Materials. 2(1-3); II. Prerequisite: Highway Engineering I Laboratory. Mr. Scholer.

An advanced course in the properties and testing of the various materials used in road construction.

280. Mechanics of Reinforced Concrete. 2(2-0); I. No credit for students who have had Strength of Materials. Prerequisite: Strength of Materials E. Mr. Scholer.

The behavior of reinforced concrete structural elements, including slabs, rectangular berms, T-beams, columns, and special floor systems under load.

FOR GRADUATE CREDIT

301. Research in Materials of Construction. 1 to 10 credits; I or II. Mr. Scholer and Mr. Robert.

Many problems related to materials used in engineering construction offer attractive fields for research. A number of special pieces of apparatus in addition to the usual equipment of strength-of-materials laboratory are available for this work. The results of such investigations, if suitable, may be incorporated in bulletins of the Engineering Experiment Station; this work may furnish materials for the master's thesis.

Architecture

Professor Weigel
Professor Walters (Emeritus)
Associate Professor Kleinschmidt
Assistant Professor Cheek
Assistant Professor Helm
Instructor Wichers
Instructor Smith[2]
Instructor Chadwick*

The courses in architecture are offered not only to provide for the fundamental training necessary for the practice of architecture, but also to give the student a facility and working knowledge which will be of immediate value to him upon graduation. The foundation which the student acquires in college should be supplemented by continual professional study, especially during those years immediately following graduation, when it is desirable that he should acquire practical experience in the employ and under the guidance of capable and experienced members of the profession. Students are most urgently advised to acquire practical experience in an architect's office during the summer vacations of their college course.

Throughout the course the instruction by lectures, recitations and drafting-room practice is fully amplified and expanded by a free use of the equipment of the Department of Architecture. Within the department is housed a good working library of the standard architectural works and leading professional magazines, together with the collections of lantern slides and photographs to all of which the student has free access. Placed about the amply lighted and well-equipped rooms of the department is a generous collection of plaster casts, including important examples of architectural fragments and ornaments from historical monuments. On the walls of the drafting rooms, where they are constantly before the student, are hung selected examples from the department's collection of original drawings, including specimens of both academic and current professional work. From time to time this exhibit is changed.

At frequent intervals, representative men actually engaged in the practice of architecture and the allied arts and trades are invited to talk to and to advise the student. During the junior or senior year under the direction of and in company with a member of the departmental faculty, each student is expected to make a visit to one or more of the neighboring cities, thus enabling him to acquaint himself with the representative work of the profession as well as with the operations and processes involved in the conduct of allied professions and industries.

Students pursuing the curriculum in architecture are urged to devote a fifth year to the work. By so doing, a student can combine the curricula in architectural engineering and architecture and receive the bachelor of science degree in both.

All drawings or designs made during the student's course are to become the property of the department, to be used or returned at the discretion of the faculty.

The department owns equipment valued at $13,680.

COURSES IN ARCHITECTURE

FOR UNDERGRADUATE CREDIT

106A. Elements of Architecture I. 3(0-9); I and SS. Mr. Smith.

A thorough treatment of the orders and fundamental elements of architectural forms; special attention to the development of a high standard of lettering and draftsmanship. Text: Charles Gourlay, *The Italian Orders of Architecture*. Charge, $1.

107A. Elements of Architecture II. 3(0-9); II and SS. Prerequisite: Elements of Architecture I. Mr. Smith.

Simple application of the forms studied in course 106A; simple architectural rendering. Charge, $1.

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* Temporary appointment.
2. Absent on leave, year 1927-'28.

111. Object Drawing I. 2(0-6); I, II, and SS. Mr. Helm, Mr. Wichers, and Mr. Smith.
The drawing of simple geometric objects; studies from fragments of antique architectural ornament.

114. Object Drawing II. 2(0-6); II, and SS. Prerequisite: Object Drawing I. Mr. Helm, Mr. Wichers, and Mr. Smith.
An amplification and expansion of the principles taught in Object Drawing I.

116. Pencil Rendering and Sketching. 2(0-6); I, and SS. Prerequisite: Object Drawing II. Mr. Helm and Mr. Wichers.
The drawing of architectural ornament, architectural fragments, and pencil sketches from nature.

117. Still-life Drawing. 2(0-6); I, and SS. Prerequisite; Water Color I (Arch. 118). Mr. Helm.
Advanced studies from full-length plaster casts in charcoal; pen and ink rendering.

118. Water Color I. 2(0-6); II, and SS. Prerequisite; Arch. 116 or approval of instructor. Mr. Helm.
Exercises in the handling of the medium and of the translation of color; theory of color.

119. Water Color II. 2(0-6); I, II, and SS. Prerequisite: Arch. 118. Mr. Helm.
Advanced study in the technique of the medium. Includes both studio work and out-of-door sketching.

120. Interior Design. 2(0-6); I, and SS. Prerequisites: Arch. 118, 145, and 244. Mr. Helm.
The principles of interior architecture with special attention to period design.

121. Life Drawing I. 2(0-6); II. Prerequisite: Arch. 118. Mr. Helm.
Drawing from the living model in charcoal. Deposit, $5.

123. Life Drawing II. 2(0-6); II. Prerequisite: Arch. 121. Mr. Helm.
A continuation of Life Drawing I. Deposit, $5.

124. Domestic Architecture. 2(2-0); I and II. Mr. Wichers.
The course is designed to help the student understand home building problems. A detailed study is made of home designing and planning with the help of lantern slides.

133. Clay Modeling. 2(0-6); I, and SS. Prerequisite: Arch. 117. Mr. Weigel and Mr. Helm.
The making of clay models, plaster casts of simple decorative fragments and anatomical forms; and construction of relief maps. Charge, $1.

134. Pen and Ink Drawing I. 2(0-6); I, II, and SS. Prerequisite: Arch. 116 or approval of instructor. Mr. Helm.
A study of the technique and drawing of fragments, casts, still-life, etc., in this medium, also outdoor sketching.

142, 144. Design I and II. 3(0-9) each; I and II respectively. Prerequisites: For I, Arch. 107A and 114; for II, Arch. 142. Mr. Weigel and Mr. Kleinschmidt.
An analysis of architectural composition and rendering. Text: Harbeson, *The Study of Architectural Design.* Charge, $1 for each course.

145, 147. Design III and IV. 5(0-15) each; I and II respectively. Prerequisites: For III, Arch. 117 and 144; for IV, Arch. 145. Mr. Weigel and Mr. Kleinschmidt.
Continuation of Design II; time problems and rapid design sketches required, at frequent intervals. Text: Harbeson, *The Study of Architectural Design.* Charge, $1 for each course.

153. Rural Architecture. 2(0-6); I. Prerequisites: Arch. 144 and 191. Mr. Wichers.

A detailed study of the small home and the architectural needs of rural communities.

154A, 157A. History of Architecture I and II. 2(2-0) each; I and II respectively. Mr. Kleinschmidt.

The history of architecture from the dawn of civilization to the end of the Roman Empire, in I; II covers the Gothic period, to 1400. Text: Fletcher, *A History of Architecture on the Comparative Method.*

158A, 160A. History of Architecture III and IV. 2(2-0) each; I and II respectively. Prerequisites: Arch. 114 and 157A. Mr. Kleinschmidt.

Continuation of Arch. 157A; finishes the history of architecture to modern times. Text: Fletcher, *A History of Architecture on the Comparative Method.*

165, 170. Commercial Illustration I and II. 2(0-6) each; I and II respectively. Mr. Helm.

The principles of advertising arrangements; making various types of advertising designs, such as newspaper advertisements, lettering, and posters; making cover designs for magazines, books, and trade catalogues; for headings, tail pieces, and decorative page arrangements; drawings carried out in black and white and in one or more colors.

178, 182. History of Civilization and Art I and II. 2(3-0) each; I and II respectively. Mr. Kleinschmidt.

In course 178, a study of development of painting, sculpture, furniture and the minor arts to the fifteenth century. In course 182, continuation to the beginning of the twentieth century.

187A. Building Materials and Construction. 3(3-0); I. Prerequisite: Elements of Architecture II (Arch. 107A). Mr. Cheek.

An introduction to the properties and uses of the materials of construction; also plumbing, heating, and lighting systems; occasional visits to buildings under construction.

191. Working Drawings and Specifications. 3(0-9); II. Prerequisites: Arch. 142 and 187A. Mr. Weigel and Mr. Wichers.

Preparing working drawings and specifications for suburban residences; drawing complete details for buildings, working out heating, plumbing, and structural problems.

192. Theory of Structures I. 4(2-6); I. Prerequisites: Arch. 191, Applied Mechanics A (Ap. Mech. 102), and Strength of Materials A (Ap. Mech. 116, 121). Mr. Cheek.

Mathematical and graphical solutions of stresses in framed structures under static loading; practical problems in the design of wood construction; occasional inspection trips to buildings under construction.

194A. Theory of Structures II. 5(3-6); II. Prerequisite: Arch. 192. Mr. Cheek.

A continuation of Theory of Structures I applied to steel and masonry structures.

196, 198. Structural Design I and II. 3(1-6) each; I and II, respectively. Prerequisite: Theory of Structures II (Arch. 194A). Mr. Cheek.

Application of the principles covered under Theory of Structures to the coordinated, grouped design of an entire structure with complete working drawings and details; preferably a problem simultaneously under consideration in an architectural design course.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201, 206. Advanced Free-hand Drawing I and II. 2(0-6) each; I and II, respectively. Prerequisites: Arch. 117 and 118. Mr. Helm.

Study of the human figure and exercises in original composition of architectural ornament, various mediums being employed.

211, 216. Advanced History of Civilization and Art I and II. 2(2-0) each; I and II, respectively. Prerequisite: Arch. 182. Mr. Weigel.

In course 211, a detailed study of civilization from the Babylonian and Assyrian empires to the fifteenth century, tracing the artistic development of each epoch; in course 216, a continuation of course 211.

221. Problems in Architectural Development. 1 to 5 credits; I and II. Mr. Weigel.

Under direct supervision of some member of the departmental staff, study of historic problems in architectural development.

230, 235. Oil Painting I and II. 2(0-6) each; I and II, respectively and SS. Prerequisite: Water Color I (Arch. 118) or approval by instructor. Mr. Helm.

Rudiments of painting in oil; sketching of simple objects and drapes. In course 235, painting of larger still-life groups and out-door sketching.

244. General History of Architecture. 3(3-0); I and II. Prerequisite: Object Drawing II (Arch. 114) or Design A (Ap. Art 106). Mr. Weigel.

The historic architectural styles of the world studied and analyzed; written papers, with sketches, required of each student.

249. City Planning. 3(0-9); I. Prerequisites: Arch. 144, Hort. 223, and Hort. 245. Mr. Weigel.

A detailed study of city planning, including transportation and street systems, parks and recreation facilities, public buildings and civic centers, subdivisions of land, restrictions and zoning.

253, 256. Design V and VI. 8(0-24) each; I and II respectively. Prerequisites: For V, Arch. 118 and 147; for VI, Arch. 253. Mr. Weigel and Mr. Kleinschmidt.

Continuation of Design IV; special training in interior design and decoration. Text: Harbeson, *The Study of Architectural Design.* Charge, $1 for each course.

FOR GRADUATE CREDIT

301, 304. Advanced Design I and II. 3(0-9) to 10(0-30) each; I and II respectively. Mr. Weigel.

A study of the planning of important buildings and groups of buildings. Course 304, a continuation of 301, may furnish material for the master's thesis.

324. Research in Architecture. 1 to 10 credits; I and II.

The study of a research problem in architecture, determined by conferences between Mr. Weigel and the student, and approved by the Graduate Council. This course may furnish material for the master's thesis.

Civil Engineering

Professor Conrad
Professor Frazier
Professor Furr
Associate Professor White
Instructor Crawford
Instructor Oakes

The purpose of the instruction in the Department of Civil Engineering is to give the student a thorough knowledge of the fundamental principles of engineering and to develop his ability to analyze engineering problems, and thus prepare the graduate to enter any one of the many special fields which are usually included under the title of civil engineering.

In addition to the laboratory equipment of the other engineering departments, which is available to civil-engineering students, the Department of Civil Engineering possesses a good assortment of transits, levels, plane tables, compasses, tapes, and chains. It also owns a precise level, a direction theodolite, a repeating theodolite, four different kinds of solar attachments, and a base-line outfit.

Approximately 90 per cent of the graduates of this department are now engaged in engineering work in cities, in the oil fields, in the government reclamation and valuation service, in consulting engineering, in highway work, in construction work, and in other work in which a knowledge of civil engineering is a prerequisite.

The department owns equipment valued at $16,429.

COURSES IN CIVIL ENGINEERING

FOR UNDERGRADUATE CREDIT

102, 111. Surveying I and II. 2(0-6) each; I, II, and SS each. Prerequisite or parallel (for I): Plane Trigonometry (Math. 101); prerequisite (for II): Surveying I. Mr. White, Mr. Crawford, and Mr. Oakes (for I); Mr. Furr and Mr. White (for II).

Course 102, the use and care of engineers' surveying instruments; course 111, land and topographic surveying. Text: Breed and Hosmer, *Surveying,* Vol. I. Charge, $1 for each course.

120. Masonry and Foundations. 2(2-0); I. Prerequisite: Engineering Physics II (Physics 150); prerequisite or parallel: Applied Mechanics I (Ap. Mech. 202). Mr. Frazier.

Design and construction of foundations; stresses in plain masonry structures; the method of designing such structures. Text: Jacoby and Davis, *Foundations for Bridges and Buildings.*

125. Civil Engineering Drawing I. 2(0-6); II. Prerequisite: Machine Drawing I (Mach. Design 111). Mr. White.

Stereotomy, shades and shadows, isometric and perspective drawing; copying working drawings of engineering structures; no text.

145. Railway Engineering I. 2(2-0); II. Prerequisites: Surveying IV and C. E. Drawing I (Civ. Engr. 125, 156, and 157). Mr. Frazier.

Railway engineering based on Wellington's economic theory; study of track construction and maintenance; design of yards and terminals. Text: Raymond, *Elements of Railroad Engineering.*

151, 155. Surveying III. 3(2-3); I. Prerequisite: Surveying II. Mr. Furr.

Topographic, hydrographic, city, and mine surveying. Text: Breed and Hosmer, *Surveying,* Vols. I and II.

Laboratory.—Topographic surveying and topographic mapping.

156, 157. Surveying IV. 3(2-3); II. Prerequisite: Surveying III; prerequisite or parallel: Calculus I (Math. 205). Mr. Furr.

Railroad curves and earthwork. Text: Allen, *Railroad Curves and Earthwork,* with tables.

161. Drainage and Irrigation I. 2(2-0); II and SS. Prerequisite and parallel: Hydraulics (Ap. Mech. 230, 235). Mr. Conrad.

Design and construction of drainage and irrigation works. Text: Pickels, *Drainage and Flood Control Engineering,* and Davis and Wilson, *Irrigation Engineering.*

170. Thesis. 1(0-3), I; and 2(0-6), II respectively. Mr. Conrad.

A report on a proposed design, an original investigation, or a library research. With approval of Mr. Conrad, thesis work may be taken in some other department, the thesis subject to be selected and approved by the department head before the October first next preceding the student's graduation. An equivalent amount of work in an elective subject approved by the dean of this division may be substituted for thesis.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Stresses in Framed Structures. 4(4-0); I and SS. Prerequisite: Strength of Materials (Ap. Mech. 211). Mr. Conrad.

Computation of stresses in bridges and buildings.

205. Civil Engineering Drawing II. 2(0-6); I and SS. Prerequisite: Strength of Materials Rec. (App. Mech. 211). Mr. Conrad.
Graphic statics and design of simple roof trusses in timber and steel.

211, 216. Astronomy and Geodesy. 4(2-6); I. Prerequisite: Surveying III (Civ. Engr. 151, 155). Mr. Frazier.
The elements of practical astronomy; precise methods of surveying and leveling. Text: Hosmer, *Geodesy.*

Laboratory.—Astronomical observations, principally for determining true meridian and latitude; base-line measurements and triangulation work.

220. Water Supply. 2(2-0); I. Prerequisite: Hydraulics (Ap. Mech. 230, 235). Mr. Frazier.
Water supply from the standpoint of consumption, collection, storage, distribution, and purification. Text: Turneaure and Russell, *Public Water Supplies.*

225. Sewerage. 2(2-0); I. Prerequisite: Hydraulics (Ap. Mech. 230). Mr. Frazier.
Design and construction of sewer systems and disposal plants.

230. Highway Engineering I Recitation. 2(2-0); I. Prerequisite: Surveying II (Civ. Engr. 111). Mr. Furr.
Location, construction, and maintenance of roads and pavements. Text: Agg, *Construction of Roads and Pavements.* (For laboratory, see Ap. Mech. 250.)

246. Design of Framed Structures. 3(0-9); II and SS. Prerequisite: Stresses in Framed Structures (Civ. Engr. 201). Mr. Conrad.
The making of general drawings for a highway truss bridge, a railroad truss bridge, and a railroad deck plate girder.

250, 255. Concrete Design. 3(2-3); II. Prerequisite: Strength of Materials (Ap. Mech. 211). Mr. Conrad.
Design of reënforced concrete chimneys, buildings, retaining walls, dams and bridges. Text: Hool and Johnson, *Concrete Engineer's Handbook.*

Laboratory.—Drawing reënforced concrete retaining walls, dams, slab bridges, and girder bridges.

256. Reënforced Concrete Arches. 3(3-0); II. Prerequisite: Concrete Design (Civ. Engr. 250, 255). Mr. Conrad.
Various types of reënforced concrete arches adapted for use in bridges, buildings, and dams; computation of stresses; arrangement of details.

260, 265. Railway Engineering II. 4(2-6); II. Prerequisite: Railway Engineering I (Civ. Engr. 145). Mr. Frazier.
Railway operation and maintenance.

Laboratory.—A reconnoissance and survey of a short railroad; making the maps, profiles, and estimates from the survey. Text: Allen, *Railroad Curves and Earthwork,* with tables.

270, 275. Highway Engineering II. 4(2-6); II. Prerequisite: Highway Engineering I (Civ. Engr. 230). Mr. Furr.
Highway laws, highway administration, and highway economics. Text: Agg and Brindley, *Highway Administration and Finance.*

Laboratory.—A reconnoissance and survey for a highway a few miles long; making the maps, profiles, and estimates from the survey.

276. Highway Economics. 3(3-0); I. Prerequisite: Highway Engineering II. Mr. Furr.
Highway transport and construction problems as affected by recent findings of research agencies. Text: Harger, *Rural Highway Pavements.*

280, 285. Drainage and Irrigation II. 4(2-6); II. Prerequisite: Drainage and Irrigation I (Civ. Engr. 161). Mr. Conrad.

Design of irrigation structures and management of irrigation projects.

Laboratory.—Making the survey for a drainage or irrigation project; making maps, estimates, and designs, using the survey as a basis.

FOR GRADUATE CREDIT

301. Advanced Bridge Stresses. 3(3-0); I. Prerequisite: Stresses in Framed Structures (Civ. Engr. 201). Mr. Conrad.

A study of deflections; stresses in continuous, movable, cantilever, suspension, mutiple intersection, and steel arch bridges; and secondary stresses.

304. Civil Engineering Research. 3 to 10 cr.; I, II, and SS. Prerequisites depend on subject of research. Mr. Conrad, Mr. Frazier, or Mr. Furr.

Original investigation or advanced study in some field relating to the practice of civil engineering.

316. Railroad Transportation. 3(3-0); II. Prerequisite: Railway Engineering I (Civ. Engr. 146). Mr. Frazier.

A study of the function of the railway system; its relation to industrial development and its correlation with other methods of transportation.

Electrical Engineering

Professor Kloeffler
Associate Professor Brenneman
Associate Professor Kerchner
Assistant Professor Hunt
Assistant Professor Jorgenson
Instructor Bueche
Instructor Nowell
Instructor Corcoran

Instruction in the Department of Electrical Engineering is planned to give the student a thorough training in the underlying principles of electrical phenomena, direct and alternating current, and in the application of electrical theory to the solution of the practical problems in the many fields of the industry. The textbook, lecture and classroom instruction is accompanied by extended courses in the laboratories, which include commercial tests on standard types of machinery and also special tests designed to exemplify the theory.

The laboratories include an electrical measurement laboratory well equipped with standards of resistance, electromotive force, self-induction and capacity. Supplementary to this measurement laboratory is a standardizing laboratory containing precision instruments for calibrating voltmeters, ammeters, wattmeters, watthour meters, and rotating standards.

The wire communication laboratory contains several demonstration panels and switchboards for magneto, common battery (manual) and automatic telephone systems, and equipment for measurements on artificial telephone lines at high frequencies.

The radio communication laboratory is supplied with equipment for high frequency measurements and the study of radio phenomena.

An illumination laboratory is equipped with bar, spherical and portable photometers and accessory equipment such as lamps, reflectors and luminaires.

The main dynamo laboratory contains examples of all types of electrical machinery and control apparatus, including more than 50 direct- and alternating-current generators and motors, from 1 to 30 kilowatts and totaling more than 450 horsepower. The instrument room in connection contains more than 100 instruments of more than 250 ranges for the measurement of current, voltage, power, frequency and other electrical quantities. The dynamo laboratory also includes a complete electric-railway test set, consisting of two modern railway motors, geared to a load and controlled by a complete H L. type control equipment.

Another dynamo laboratory is fitted with direct-current motor-generator sets and accessory equipment for the freshman course in electric machine construction and operation.

The wiring laboratory for the freshman course contains sixteen booths or rooms, in imitation of buildings both finished and in process of construction, and a complete stock of supplies for cleat, concealed knob and tube, conduit, and condulet construction which provides students with actual practice in wiring buildings.

The equipment belonging to the department is valued at $42,406.

COURSES IN ELECTRICAL ENGINEERING

FOR UNDERGRADUATE CREDIT

160, 165. Electrical Engineering C. 3(2-2, 1); II. Prerequisite: Engineering Physics II (Physics 150). Mr. Jorgenson.

The fundamental principles of direct-current and alternating-current electricity, with emphasis upon proper installation and operation of different classes of machines. Text: Bailey, *Dynamo-Electric Machinery.*

Laboratory.—Practice to give a knowledge of the most important commercial tests; proper use of electrical instruments; a written report of each test. Text: Wilson, *Dynamo Laboratory Outlines.* Charge, $1.50.

170. Electrical Machinery and Construction. 2(0-6); I, II, and SS. Prerequisite: High School Physics. Mr. Hunt, Mr. Jorgenson and Mr. Nowell.

An introductory course in applied electricity; various modern methods of interior wiring, and installation, care, operation and repair of electrical machinery. Texts: Croft, *Wiring for Light and Power,* and Timbie, *Essentials of Electricity.* Charge, $3.

179. Principles of Electrical Engineering. 2(2-0); I and II. Prerequisites: Electrical Machinery and Construction (Elec. Engr. 170) and Trigonometry (Math. 101). Mr. Kloeffler.

The fundamental principles of electrical circuits; an introduction to later courses in direct and alternating-current machines.

195. Thesis. 1(0-3), I; and 2(0-6), II. Mr. Kloeffler, Mr. Brenneman, Mr. Kerchner, Mr. Bueche and Mr. Corcoran.

Subject for thesis work selected in consultation with the department head at the beginning of the senior year; every opportunity given to work out original ideas as to design and operation of electrical apparatus and machinery.

FOR GRADUATE AND UNDERGRADUATE CREDIT

203, 204. Direct-current Machines I. 4(3-2, 1); I, II, and SS. Prerequisites: Calculus I (Math 205) and Engineering Physics II (Physics 150). Mr. Brenneman and Mr. Nowell.

A detailed study of the fundamental principles of magnetic and electric circuits and their application to the various types of direct-current machines.

Laboratory.—A series of experiments designed to necessitate careful, accurate measurement. Text: Swenson and Frankenfield, *Testing of Electromagnetic Machinery,* Vol. I. Charge, $1.50.

206, 207. Direct-current Machines II. 3(2-2, 1); I, II, and SS. Prerequisites: Direct-current Machines I and Electrical Measurements. Mr. Kloeffler, Mr. Hunt, Mr. Jorgenson, and Mr. Nowell.

A detailed study of special types of direct-current machinery, dynamo losses, commutation, and Kirchoff's laws as applied to direct-current circuits.

Laboratory.—Special attention to the different methods of determining generator and motor efficiencies and to proper tabulation and interpretation of results. Text: Same as for Course 204. Charge, $1.50.

209, 211. Alternating-current Machines I. 5(4-3); I, II, and SS. Prerequisites: Calculus II (Math. 206) and Direct-current Machines I (Elec. Engr. 203, 204). Mr. Kerchner, Mr. Hunt, Mr. Jorgenson, and Mr. Corcoran.

A mathematical treatment of alternating-current phenomena. Text: Lawrence, *Principles of Alternating Currents.*

Laboratory.—A series of experiments illustrating the theoretical work; practice in accurate measurement of capacity and inductance, and the effect of each upon the circuit; study of polyphase circuits. Charge, $1.50.

214, 216. Alternating-current Machines II. 4(3-3); I, II, and SS. Prerequisite: Alternating-current Machines I. Mr. Brenneman, Mr. Kerchner, Mr. Hunt, and Mr. Corcoran.

Principles of design, construction and operation of transformers, alternating-current generators, and synchronous motors.

Laboratory.—A series of experiments involving commercial and special tests of transformers, alternators and synchronous motors. Charge, $1.50.

217, 218. Electrical Communication I. 3(2-2, 1); I. Prerequisite: Alternating-current Machines I (Elec. Engr. 209, 211). Mr. Kloeffler.

The principles of telephone communications as applied to the apparatus and circuits used on magneto, common battery (manual), Strowger automatic, and machine switching systems; toll telephone practice, involving the use of line loading, repeaters, and carrier currents. Text: Kloeffler, *Telephone Communication Systems.*

Laboratory.—Study of telephone apparatus and circuits on magneto, common battery, and automatic systems; measurements made on artificial telephone lines. Charge, $1.

219, 223. Radio Communication. 3(2-3); I. Prerequisite: Alternating-current Machines I (Elec. Engr. 209, 211). Mr. Kloeffler and Mr. Bueche.

The production, measurement, and control of high-frequency alternating currents and electro-magnetic waves, and their application to radio telegraphy and telephony and carrier current transmission; principles of operation of thermionic vacuum tubes and a proper consideration of these principles in their application to the generation, modulation, amplification, and detection of continuous waves.

Laboratory.—Practical application of the various principles studied in the classroom. Charge, $1.

224, 225. Alternating-current Machines III. 5(3-3, 3); I, II, and SS. Prerequisite: Alternating-current Machines II. Mr. Brenneman, Mr. Kerchner, Mr. Hunt, Mr. Jorgenson, and Mr. Corcoran.

Continuation of Alternating-current Machines II (E. E. 214), including converters, induction and commutator alternating current motors, rectifiers, alternating-current instruments, and accessory apparatus.

Laboratory.—Continuation of Alternating-current II Laboratory. (Elect. Engr. 216). Tests on machines listed in Elect. Engr. 224. Charge, $2.

227, 228. Electrical Measurements. 3(2-3); I, II, and SS. Prerequisites: Calculus I (Math. 205) and Engineering Physics II (Physics 150). Mr. Kloeffler and Mr. Bueche.

Various methods for the measurement of resistance, current, electromotive force, capacity, and inductance. Text: C. M. Smith, *Electric and Magnetic Measurements.*

Laboratory.—Applications of fundamental principles studied in the classroom. Charge, $2.

230, 231. Electrical Engineering M-I. 4(3-2, 1); I. Prerequisites: Calculus I and Engineering Physics II. Mr. Hunt and Mr. Nowell.

Direct-current machines with reference to the fundamental laws of the electric circuit, the principles of direct-current machinery, and the more important commercial tests; an introduction to alternating-current circuits. Text: Bailey, *Dynamo Electric Machinery.*

Laboratory.—Practice in the proper use of electrical measuring instruments; a written report on each test. Charge, $1.50.

232, 233. Electrical Communication II. 3(2-3); II. Prerequisite: Electrical Cummunication I. Mr. Kloeffler and Mr. Bueche.

Transmission problems, telephonic efficiencies, telephone repeaters, wave filters, and carrier currents. Text: Johnson, *Transmission Circuits for Telephonic Communication.*

Laboratory.—High frequency measurements as applied to wire communication. Charge, $1.

235, 236. Illuminating Engineering. 3(2-3); I. Prerequisites: Calculus I and Engineering Physics II. Mr. Kloeffler and Mr. Hunt.

Photometry, light standards, principles of illumination and illumination design. Text: Barrows, *Light Photometry and Illuminating Engineering.*

Laboratory.—Photometric measurements of light intensity, luminous flux, brightness, and illumination; the determination of light distribution about various illuminants and luminaires. Charge, $1.

238, 239. Electrical Instruments and Meters. 3(2-3); II. Prerequisite: Alternating-current Machines I. Mr. Kloeffler and Mr. Bueche.

The operation, construction and testing of electrical measuring instruments such as indicating instruments, watt-hour meters, instrument transformers, and relays.

Laboratory.—The various methods of testing and calibrating electrical instruments and meters.

This course should accompany Electrical Instruments and Meters.

240. Electric Railways. 2(2-0); II. Prerequisite: Alternating-current Machines II. Mr. Kerchner and Mr. Nowell.

The development of electric traction; traffic conditions and train schedules; speed-time curves; power generation and distribution for electric railway signal systems; types of cars and locomotives in use; various control systems; and adaptability of electric traction to steam railroads. Text: Harding, *Electric Railway Engineering.*

242, 243. Electrical Engineering M-II. 4(3-2, 1); II. Prerequisite: Electrical Engineering M-I (Elec. Engr. 230, 231). Mr. Brenneman and Mr. Hunt.

The important principles of alternating-current machinery. Text: Bailey, *Dynamo-Electric Machinery.*

Laboratory.—Practice in the use of alternating-current instruments; standard tests of alternators, motors, and transformers, and methods of operating the different types of alternating-current machinery. Charge, $1.50.

246. Storage Battery Engineering. 2(2-0); I. Prerequisites: Chemistry E I (Chem. 108) and Engineering Physics II (Phys. 150). Mr. Brenneman.

Process of manufacture, molecular and chemical theory of operation, behavior on charge and discharge, rating and life of a battery; battery diseases, their causes, methods of recognition, and remedies; methods of charge and discharge; and features of batteries that determine their adaptability to central stations, farm lighting service, and gas and electric vehicles. Text: Vinal, *Storage Batteries,* with other books for reference.

250. Commercial Engineering. 2(2-0); II. Prerequisite: Economics (Econ. 101). Mr. Kloeffler.

The relation of the engineer to commercial life; salesmanship. Text: Russell, *Textbook of Salesmanship.*

255. Electric Heating. 2(2-0); I. Prerequisite: Direct-current Machines I (Elec. Engr. 203). Mr. Kerchner and Mr. Nowell.

The theory and practice of electricity as applied to cooking, room-heating, japanning ovens, spot welding, arc welding, and the various types of electric arc and induction furnaces.

270, 271. Electrical Machine Design I and II. 1(0-3) and 2(0-6), respectively; I and II. Prerequisite: Direct-current Machines I (Elec. Eng. 203). Mr. Brenneman.

In I, the principles of electrical design; each student makes calculation for electromagnets and a direct-current generator. Text: Still, *Elements of Electrical Design.* In II, study of the principles of alternating-current design; each student makes the necessary design calculations for a transformer.

275. Advanced Calculations in Alternating-current Circuits. 2(2-0); II. Prerequisite: Alternating-current Machines I (Elec. Engr. 209). Mr. Kerchner.

Use of the vector methods in solving alternating-current problems; solving of single-phase, balanced or unbalanced three-phase problems in net works; computations of real and reactive power or the reverse handled by symbolic notation; problems illustrated by the corresponding vector diagram.

280. Generation, Transmission, and Distribution of Electrical Energy. 3(3-0); II. Prerequisite: Elec. Engr. 213. Mr. Brenneman.

Selection of equipment for power houses and substations; station operation and management; and problems of power transmission and systems of distribution. Text: Still, *Electrical Power Transmission.*

284. Transient Electrical Phenomena. 3(3-0); II. Prerequisites: Alternating-current Machines I and II, and Differential Equations (Math. 201). Mr. Brenneman.

Two phases of electrical phenomena; (*a*) transients in time, and (*b*) transients in space. Text: Steinmeitz, *Transient Electrical Phenomena.*

286. Advanced Illumination. 2(2-0); II. Prerequisite: Illuminating Engineering (Elec. Engr. 235). Mr. Kloeffler.

Lighting systems adapted for the illumination of stores, offices, drafting rooms, machine shops, railway shops, hospitals, and city streets.

FOR GRADUATE CREDIT

336. Electrical Engineering Research. 1 to 10 credits; I or II. Prerequisite: Alternating-current Machines II (Elec. Eng. 214). Mr. Kloeffler, Mr. Brenneman, and Mr. Kerchner.

An introduction to more elaborate work of special investigation; adapted to meet the needs and attainments of individual students; particular problems which must be studied by reference to existing literature and by experimental work, and on which completed reports must be submitted.

General Engineering

Dean Seaton

101. Engineering Lectures. R(1-0); entire freshman year. Dean Seaton, other members of the engineering faculty, and visiting practicing engineers.

Designed to acquaint freshmen engineers and architects with fundamental principles of their profession and to give a general survey of the field.

105. Seminar. R(1-0); sophomore, junior, and senior years. Members of the engineering faculty.

Presentation by students of abstracts and reviews of articles appearing in the journals of their respective societies or in the technical press of their profession, or preparation of original articles. The work differs for the various curricula, and as far as possible is conducted by the student branches of the professional engineering societies. Occasionally these individual groups unite in the General Engineering Society, under whose auspices lectures are given by practicing engineers and by members of the engineering and college faculty on topics of general interest to engineering students.

Inspection trips to nearby industrial centers are annually made during the junior and senior years. The plants inspected are carefully selected to ex-

emplify various engineering applications in practice. All students in the departments making the inspection are required to accompany the party unless excused and assigned special work to make up the absence by the head of his department.

Machine Design

Professor Pearce
Associate Professor Smutz*
Associate Professor Durland
Assistant Professor Gingrich
Instructor Olsen
Instructor Branigan
Instructor Sitz

The courses in engineering drawing and machine drawing deal principally with the training of the freshman and sophomore students in visualization, and the application of graphical language to engineering problems, with particular reference to commercial drafting-room methods. The object of these courses is primarily to develop this graphical language as a tool to be used in all future engineering work.

The courses in machine design deal with the mechanical transmission of power, the analysis of the action of machine parts, and the design of machine elements and of complete machines with regard to strength, stiffness and general operating efficiency. In this group may be included also the courses in flour-mill design, which deal with the layout of flow sheets and the selection and arrangement of milling machinery.

The department owns equipment valued at $9,339.

COURSES IN DRAWING AND MACHINE DESIGN

FOR UNDERGRADUATE CREDIT

101. Engineering Drawing. 2(0-6); I, II, and SS. Mr. Gingrich, Mr. Olsen, Mr. Branigan, and Mr. Sitz.

The selection and use of drawing instruments, construction of geometrical figures, lettering, orthographic projections and sections, and pictorial methods of representation. Text: French, *Engineering Drawing,* chapters 1 to 7, inclusive.

106. Descriptive Geometry. 2(0-6); I, II, and SS. Prerequisites: Course 101, and Solid Geometry. Mr. Gingrich, Mr. Olsen, and Mr. Branigan.

More advanced problems than in Engineering Drawing, involving the point, line, and plane; the intersection and development of the surfaces of geometric solids; practical applications of the principles involved; emphasis on developing the students ability to visualize drawings in the third angle. Text: Cutter, *Descriptive Geometry.*

107. Descriptive Geometry A. 3(0-9); I. Mr. Gingrich and Mr. Sitz.

This course is primarily for architectural students, and its problems are all related to their work. Text: Young and Baxter, *Descriptive Geometry.*

108. Shades and Shadows, and Perspective. 3(0-9); II. Prerequisites: Descriptive Geometry A, and Elements of Architecture I (Arch. 106A). Mr. Gingrich and Mr. Sitz.

Conventional shades and shadows of common geometrical solids, solids of revolution, and simple architectural members; the theory of perspective as applied to the same simple solids and to problems from architectural practice. Texts: McGoodwin, *Architectural Shades and Shadows,* and Lubschez, *Perspective.* Charge, $1.50.

111. Machine Drawing I. 2(0-6); I, II, and SS. Prerequisite: Descriptive Geometry (Mach. Design 106). Mr. Pearce, Mr. Durland, and Mr. Branigan.

Conventional representations, working drawings, modern drafting-room sys-

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* Absent on leave, 1927-'28.

tems, and the reproduction of drawings; special emphasis given to proper selection of views to present the necessary information in convenient forms, dimensioning, checking for errors, and the subject matter and arrangement of titles and notes. Text: French, *Engineering Drawing.*

116. Machine Drawing II. 3(0-9); I, II, and SS. Prerequisites: Machine Drawing I (Course 111). Mechanism (course 121) must precede or accompany this course. Mr. Pearce, Mr. Durland, and Mr. Olsen.

The making of free-hand sketches of simple machine parts and complete working drawings from these sketches without further reference to the objects; kinematic problems, including belting, cams, linkages, and gears to fulfill specified conditions. Text: French, *Engineering Drawing,* chapter 12, and Schwamb, Merrill, and James, *Elements of Mechanism.*

117. Machine Drawing E-II. 2(0-6); I, II, and SS. Prerequisite: Machine Drawing I. Mr. Pearce, Mr. Olsen, and Mr. Sitz.

Machine sketching from parts of actual machines; complete working and assembly drawings. Practice is given in tracing and blue printing. Text: French, *Engineering Drawing,* chapter 12.

121. Mechanism. 3(3-0); I, II, and SS. Prerequisites: Plane Trigonometry (Math. 101) and Descriptive Geometry (Mach. Design 106). Mr. Pearce, Mr. Durland, and Mr. Olsen.

A careful study of the fundamental elements of machinery with reference to the transmission of motion and force, and to their forms and arrangements in actual machines; the solution of a large number of graphical and mathematical problems is required. Text: Schwamb, Merrill, and James, *Elements of Mechanism.*

126. Thesis. 1(0-3); I; and 2(0-6), II, respectively. Mr. Pearce.

Excellent material for thesis study furnished by projects in machine design or flour-mill design; subject of the investigation selected in consultation with the head of the department at the beginning of the senior year.

FOR GRADUATE AND UNDERGRADUATE CREDIT

204, 205. Machine Design I. 5(3-6); I. Prerequisites: Strength of Materials (Ap. Mech. 211), Machine Drawing II (Mach. Design 116), and Steam and Gas Engineering II. Mr. Pearce and Mr. Durland.

The straining actions in machine elements; frictions and lubrication; the action of reciprocating parts in engines; problems arising in the transmission of power and in the design of high-speed machinery. Texts: Leutwiler, *Machine Design,* and Pearce, *Class Notes on the Dynamics of the Reciprocating Engine.*

Laboratory.—Parts of a steam boiler designed in strict conformity to the A. S. M. E. Boiler Code; calculations for a number of simple machines and machine parts, paralleling the recitation class assignments.

210. Machine Design II. 2(0-6); II. Prerequisite: Courses 204, 205. Mr. Pearce.

Design of a small power shear; calculations made for all parts; a graphical analysis made of the stress in the shaft; working drawings made; and the rotative effect diagram of a steam engine.

214. Flow Sheet Design. 2(0-6); I. Prerequisite: Machine Drawing II (Mach. Design 116) and (Mill. Ind. 110). Mr. Pearce.

The construction of complete flow sheets for medium capacity flour mills.

215. Flour-mill Design. 2(0-6); I. Prerequisites: Strength of Materials E (Ap. Mech. 216) and Milling Practice I (Mill. Ind. 109). Mr. Pearce.

The making of a design for a medium capacity flour mill, including the construction of a complete flow sheet, and the selection and planning of the arrangement of the machinery.

225. Graphics of Engineering Formulas. 2(2-0); II. Prerequisite: Plane Analytical Geometry (Math. 110). Mr. Pearce.

Design of empirical equations according to the methods of selected points, averages, or least squares, and a consideration of general methods of plotting; the diagramming of formulas; construction of nomographic or alignment charts, in which all the variables of a formula are along any straight transversal cutting the lines of the diagram. Text: Hewes and Seward, *Design of Diagrams for Engineering Formulas.*

FOR GRADUATE CREDIT

301. ADVANCED MACHINE DESIGN. 1 to 10 credits; I or II. Mr. Pearce.
At the option of the student this course may include either the design of a machine or a study of the advanced dynamics of machinery, with special reference to inertia effects, torque characteristics, fly-wheel design, and balancing of multiple cylinder engines and compressors, the design of turbine drums and disks, the critical speed of rotating parts, and gyroscopic action. The course may furnish material for the master's thesis.

Mechanical Engineering

Professor CALDERWOOD
Associate Professor MACK
Assistant Professor BRAINARD
Instructor LEONARD

The object of the instruction in this department is to give to the student the fundamental principles underlying the design, construction, selection, operation and testing of steam boilers; steam engines and steam turbines; gas producers; gas and petroleum engines; compressed-air and refrigerating machinery; condensers and evaporators. These subjects are developed by courses in engineering thermodynamics and in steam and gas engineering, and are followed in the fourth year by courses in power-plant engineering, in refrigeration, and in heating and ventilation. The classroom instruction of every course consists of lectures and recitations, which are paralleled by work in the drafting room and laboratory, and supplemented by numerous practical problems, trade catalogues, notes, and inspection trips requiring written reports.

The mechanical-engineering laboratories are well equipped for the testing of boilers, steam engines, gas engines, refrigeration machinery, fuels, lubricants, and other equipment and materials met with in the practice of mechanical engineering. In addition to the equipment installed especially for experimental purposes, all the heating, power, ventilating, and pumping equipment of the College subserves the further purpose of experimental work.

The equipment belonging to this department is valued at $25,785.

COURSES IN MECHANICAL ENGINEERING

FOR UNDERGRADUATE CREDIT

101, 105. STEAM AND GAS ENGINEERING I. 5(4-3); I, II, and SS. Prerequisites: Mechanism (Mach. Design 121) and Calculus II (Math. 206). Mr. Calderwood, Mr. Mack, Mr. Brainard, and Mr. Leonard.

Heat-power engineering, including valve gears and thermodynamics, with special stress upon the thermodynamics of gases and vapors, and gas and vapor cycles. Texts: Fessenden, *Valve Gears,* and Moyer, Calderwood and Potter, *Elements of Engineering Thermodynamics.*

Laboratory.—Study and calibration of steam gauges, indicators, and planimeters; valve-setting and steam-engine operations; study of calorimeters, flow meters, and feed-water heaters; determination of the indicated and brake horsepower, mechanical efficiency and the steam consumption of high-speed automatic cut-off, Corliss, simple and compound engines; tests of DeLaval, Kerr and Terry steam turbines. Text: Carpenter and Diederch, *Experimental Engineering,* used in this and subsequent laboratory courses. Charge, $1.

110, 115. STEAM AND GAS ENGINEERING II. 4(3-3); I, II, and SS. Pre-

requisite: Course 101. Mr. Calderwood, Mr. Mack, Mr. Brainard, and Mr. Leonard.

A detailed study of steam engines, steam boilers, steam turbines, internal-combustion engines, fuels and combustion, gas producers, and other power-plant equipment. Text: Gebhardt, *Steam Power Plant Engineering.*

Laboratory.—Proximate analysis of coal; determination of the calorific values of solid, liquid and gaseous fuels; evaporative tests of steam boilers; tests of internal-combustion engines; test of compressed air and refrigerating machinery. Charge, $1.

120, 125. Steam and Gas Engineering C. 3(2-3); II. Prerequisites: Engineering Physics II and Calculus II. Mr. Brainard and Mr. Leonard.

Steam boilers, steam engines, steam turbines, gas and oil engines, including the various auxiliaries. Text: Allen and Bursley, *Heat Engines.*

Laboratory.—Study and calibration of steam gauges, indicators, and planimeters; calorimeters; evaporative tests of steam boilers; determination of the heating value of liquid and gaseous fuels; tests of steam engines; operation and testing of refrigerating machines. Charge, $1.

130. Elements of Steam and Gas Power. 2(0-6); I and II. Mr. Brainard and Mr. Leonard.

An elementary study of steam engines, steam turbines, steam boilers, steam power-plant auxiliaries, gas and oil engines, natural and manufactured gas, gas power-plant auxiliaries, and the elements of automotive engineering. Text: Potter and Calderwood, *Elements of Steam and Gas Power Engineering.* Charge, 50 cents.

170, 175. Dairy Refrigeration. 2(1-3); I. Mr. Brainard.

The elementary theory and principles of operation of various refrigerating and ice-making machinery and of cold storage, with special reference to the dairy industry.

Laboratory.—Various types of refrigeration systems and their operation; steam engine operation; tests of refrigeration machines. Charge, $1.

195. Thesis. 1(0-3), I; and 2(0-6); II, respectively. Mr. Calderwood and Mr. Mack.

The department laboratories are well equipped with apparatus suitable for experimental and research work in the field of heat-power engineering. Subject for investigation to be selected in consultation with the department head at the beginning of the senior year.

FOR GRADUATE AND UNDERGRADUATE CREDIT

206. Power-plant Engineering. 3(0-9); I. Prerequisite: Mech. Eng. 110. Mr. Mack, Mr. Brainard, and Mr. Leonard.

Complete power-plant testing; special investigations of steam-engine performance; operation of gas producers; advanced laboratory work on internal-combustion engines; the designing of a complete power plant; and the solution of special problems dealing with power generation. Charge, $1.50.

210, 215. Refrigeration, Heating, and Ventilation. 3(2-3); II. Prerequisite: Mech. Eng. 110. Mr. Mack.

Fundamental principles of refrigerating systems; the application of refrigeration to ice making, cold storage, and the cooling of air, liquids, and solids; fundamental principles of heating and ventilation. Text: Allen and Walker, *Heating and Ventilation,* and notes on refrigeration.

Laboratory.—Tests of refrigerating machinery and of the thermal conductivity of insulating materials; tests of fans and blowers, radiators and house-heating boilers; the design of heating and ventilating systems for buildings. Charge, $1.

230. Advanced Thermodynamics. 2(2-0); I. Prerequisite: Mech. Eng. 101. Mr. Calderwood.

The advanced phases of engineering thermodynamics, including research work along fundamental properties of gases and vapors.

235. Steam Turbines. 2(2-0); II. Prerequisite: Mech. Eng. 206. Mr. Calderwood.

The theoretical principles involved in the various important types of steam turbines and the construction and operation of some of the commercial types; the selection of a steam turbine as a prime mover for power plants operating under particular operating conditions; the effect of factors such as superheat, vacuum, and pressure.

FOR GRADUATE CREDIT

305. Engineering Research. 1 to 10 credits; I or II. Mr. Calderwood and Mr. Mack.

The laboratory work is correlated with the work of the Engineering Experiment Station. Investigations on lubricants, fuels, combustion, internal-combustion engines, steam engines, steam turbines, steam boilers, gas producers, refrigeration, heat-insulating materials, heating and ventilation, compressed air, and similar subjects are carried on. Data secured in this course may be used as the basis for a master's thesis.

Shop Practice

Professor Carlson
Associate Professor Sellers
Associate Professor Graham
Assistant Professor Jones
Assistant Professor Lynch
Assistant Professor Aiman
Assistant Professor Sink
Instructor Grant
Instructor Doelz
Instructor Loomis
Assistant Greeley
Assistant Irwin

The work in the shops is planned to meet the needs of three classes of students: (1) those in the special courses related to engineering and agriculture who expect to make use of the knowledge gained in their subsequent work in the shops and on the farm; (2) those who are training themselves for teaching and need a general knowledge of the principles underlying shop work, together with sufficient skill in the performance of various operations to be able to instruct others; and (3) those in the courses in engineering whose need is to secure a thorough knowledge of the methods of performing various kinds of shop work; of the machines best suited for the different purposes; of the amount of work that may be expected of the different machines and of the workman under different conditions.

The shop building is a series of connected structures. The woodworking shop consists of two rooms, 40 by 90 and 35 by 42 feet, respectively. The wood machinery room is 45 by 81 feet and contains an excellent assortment of machines used in exemplifying commercial woodworking methods. The farm shop, 65 by 75 feet, is equipped for handling farm shop projects. The machine shop, 40 by 170 feet, is one of the best equipped shops of its kind in the country. The blacksmith shop is 50 by 100 feet and is equipped with thirty modern down-draft forges, oxyacetylene welding outfits and other important equipment. The iron and brass foundries, 27 by 100 and 24 by 34 feet, respectively, are modern in every respect.

A locker room of ample capacity is conveniently located near the shops building for the use of students taking work in the department.

The value of equipment belonging to the department is $44,539.

COURSES IN SHOP PRACTICE

FOR UNDERGRADUATE CREDIT

101. Engineering Woodwork I. 1(0-3); I, II, and SS. Mr. Aiman and Mr. Irwin.

Importance of the use of methods, machinery, and men in connection with an industrial woodworking plant; forest conditions, wastage, the structural

growth of wood, and the kiln drying of lumber. Text: Koehler, *Properties and Uses of Wood.*

117. Manual Training for Primary Grades. 2(0-6); II and SS. Mr. Loomis.
Exercises suitable for pupils from the primary to the eighth grade; selection of suitable problems, material and equipment; special instruction in methods of teaching this work. Charge, $2.50.

119. Reed Furniture Construction. 2(0-6); I, II, and SS. Prerequisite: Shop 125. Mr. Loomis.
Exercises with reed and art fiber in constructing commercial articles; special instruction in methods of teaching this work. Charge, $2.50.

120. Woodworking for Grammar Grades. 2(0-6); I, II, and SS. Mr. Loomis.
Elementary manual training for those who are preparing to teach problems suitable for grammar grades. Charge, $2.50.

125. Woodworking I for High Schools. 2(0-6); I, II, and SS. Prerequisite: Shop 120. Mr. Loomis.
Continuation of course 120; problems suitable for high school students; special attention to the study of woods, methods of finishing, and use and care of tools. Charge, $2.50.

130. Woodworking II for High Schools. 2(0-6); I, II, and SS. Prerequisite: Shop 125. Mr. Loomis.
Advanced work in cabinet construction by the use of woodworking machinery, and such bench work as is necessary; both quantity and quality is emphasized, in order that proper use be made of time; the use, care, and selection of machines for a manual training shop. Charge, $2.50.

135. Wood Turning. 2(0-6); II and SS. Prerequisite: Shop 130. Mr. Irwin.
Practice in handling the lathe and turning tools. Charge, $2.50.

140. Advanced Woodwork. 2(0-6); I, II, and SS. Prerequisite: Shop 130. Mr. Loomis.
An opportunity to specialize in wood finishing, cabinet work, or some other work of special interest to the student. Charge, $2.50.

142, 143. Automobiles I and II. 2(2-0), I; and 3(1-6), II, respectively. Prerequisite: High School Physics. Mr. Sink.
In I, the general principles of construction and operation of the automobile; in II, a continuation of Automobiles I supplemented by laboratory practice. Charge (for II), $5.

147. Farm Carpentry I. 3(1-6), I and SS. Mr. Graham.
Rafter cutting and erection, studding and siding work, making window and door frames, hanging doors, and similar operations on full-size construction work; making out bill of material; care and upkeep of tools; designed for training of teachers who must solve problems in connection with carpentry work on the farm. Charge, $2.50.

150. Forging I. 1(0-3); I, II, and SS. Mr. Lynch.
Principles and operation of drawing, bending, upsetting, welding, twisting, splitting, and punching iron and steel, and proper methods of making forgings and tools. Charge, $2.50.

157, 158. Farm Blacksmithing I and II. 1(0-3) each; I and SS, and II and SS, respectively. Mr. Lynch.
In I, preliminary work same as in Shop 150; exercises closely related to work on the farm; designed to train teachers for work in rural communities. Text: Bacon, *Forge Shop Practice.* Charge, $2.50.
In II, more advanced instruction in the working of iron and steel, and in the annealing, hardening, and tempering of tools. Charge, $2.50.

161. Foundry Production. 1(0-3); I, II, and SS. Mr. Sink and Mr. Grant.

Study of construction and use of wood and metal patterns, pattern plates and molding machinery together with practice in the operation and control of the foundry. Charge, $1.

165. Metallurgy. 2(2-0); I, II, and SS. Prerequisites: Chemistry E-I and E-II; or may be taken with Chemistry E-II. Mr. Sellers.

Manufacture and use of iron, steel, copper, and their alloys; proper selection and use of these in the manufacturing industries.

167. Metallography. 1(0-3); I and II. Prerequisites: Shop 150 and 165, or may be taken with the latter. Mr. Sellers and Mr. Greeley.

The microscopic constituents of the different grades of iron, steel, and the more common nonferrous alloys; changes in the structure and properties of the metals as produced by heat treatment, mechanical working, and composition. Charge, $2.50.

170. Machine Tool Work I. 2(0-6); I, II, and SS. Prerequisite: Shop 161. Mr. Jones and Mr. Doelz.

Advance in chipping, filing, shaper and planer work; scraping, drilling, and turning on the lathe. Text: Smith, *Advanced Machine Work*. Charge, $5.

175. Farm Shop Methods. 3(1-6); I and SS. Prerequisites: Shop 147 and 157. Mr. Graham.

Babbitting, soldering, drilling, and drill grinding, thread cutting with dies and taps, tool sharpening, belt lacing, repair of machinery, and other practical operations; designed to train teachers in farm shop work. Charge, $2.50.

184, 185. Shop Practice Teaching I and II. 3(2-3) and 2(0-6), respectively; I, II, and SS. For prerequisites, consult instructor. Mr. Graham.

In I, shop organization, materials of construction, selection and care of tools and shop equipment, preparation of job sheets and lesson plans; actual shop practice, involving construction projects in wood or metal, and practice in the conduct of classes in shop work.

In II, for those who wish to specialize in teaching any phase of work offered by the Department of Shop Practice; special assignments so arranged as to secure a more general knowledge of the principles underlying the shop work taken and to provide actual teaching experience under supervision.

192, 193. Machine Tool Work II and III. 2(0-6) and 1(0-3), respectively; I, II and SS. Prerequisite: Shop 170. Mr. Jones and Mr. Doelz.

In II, progressive problems in turning, calipering, boring, reaming, taper turning, threading on the lathe, in chucking, use of forming tools, gear cutting; study of cutting edges and tool adjustments best suited to the different metals, cutting speeds and feeds. Text: Same as for course 170. Charge, $5.

In III, work on the turret lathe, boring mill, hand and automatic screw machines, and grinder; practical work with jigs and fixtures and a study of rapid production of duplicate parts. Charge, $2.50.

195. Thesis. 1(0-3), I; and 2(0-6), II, respectively. Mr. Carlson and Mr. Sellers.

The student works out problems of interest and value to himself under his own initiative, but subject to the supervision of his instructors. Ample facilities are available for carrying on work of a constructive or investigative nature.

FOR GRADUATE AND UNDERGRADUATE CREDIT

245A. Factory Engineering. 2(2-0); I and II. Prerequisites: Shop 170 and Ap. Mech. 211. Mr. Carlson.

Problems of the factory executive, such as the selection, installation, and arrangement of direct and indirect equipment, the standardization of machines and tools, stock and store methods, and the various other factors that have to do with the design and control of factories.

255. Factory Design. 2(0-6); II. Prerequisite: Shop 245. Mr. Carlson.
Knowledge gained in the shops and laboratories and in Factory Engineering (Shop 245A) is used in the design of a factory.

260. Advanced Shop Practice. 1 to 5 credits; I and II. Mr. Carlson and assistants.
Opportunity to specialize to a limited degree along certain lines of shop practice, such as heat treatment of steel, oxyacetylene and electric welding, jig and die work, woodworking, pattern making, foundry practice, cutting speeds and feeds, shop management, and systems. Charge varies with subject matter. All assignments must be approved by the head of the Department of Shop Practice.

265. Shop Practice Research. 1 to 10 credits; I and II. Mr. Carlson and Mr. Sellers.
Investigation of some phase of shop practice of special interest to the student. All assignments must be approved by the head of the Shop Practice Department.

270, 275. Automotive Engineering. 2(1-3); II. Prerequisites: Ap. Mech. 211, 220 and Mach. Design 204, 205. Mr. Sink.
The design and operation of the various parts of the automobile. A course adapted to the needs of those who expect to follow some phase of automobile work or to take up employment in automobile factories. Charge, $2.50.

Engineering in the Summer School

In order to encourage the introduction of manual training and industrial drawing in the common schools and high schools of the state, and to improve the quality of work now being given, the College offers summer courses in mechanical drawing, manual training, and shop practice for high-school and grade teachers.
In addition various courses required in the several engineering curricula are offered in the Summer School. This enables teachers who wish to take an engineering curriculum to get a considerable start on the work during their summer vacations, and also enables College students who are irregular to make up their back courses.
For full information in regard to the courses offered, a special circular giving details concerning the Summer School may be had upon application to the vice president of the College.

Special Courses Related to Engineering

Special one- and two-year courses in trades related to engineering dealing with automobile repair, machine-shop work, foundry practice and blacksmithing are grouped with other special courses in another part of this catalogue, and are there described in detail. Reference should be made to the general index in the back of this book.

The Division of General Science

JULIUS TERRASS WILLARD, *Dean.*

In the class of colleges to which this institution belongs the classical studies of the older type of college are replaced by work in the sciences and in professional and vocational subjects. A sound basis for technical training includes thorough training in mathematics, physical science, and biological science. It is believed also that education should include some preparation for the discharge of one's duties to the state and to the community in which he lives. It should afford him that discipline and culture which alone can give him a grasp of the relations among persons and activities, peoples and events, with breadth of view and tolerance of attitude, and hence an influence over his associates and fellow citizens of every station of life.

It is the province of the departments grouped in this division of the College to give this basic, scientific, cultural and disciplinary training. Their work is not only foundational, but it penetrates through all of the characteristic vocational courses of the institution, as the structural steel of the modern skyscraper penetrates the entire building and forms a secure framework and support for the more readily visible and evidently important parts. The departments of this division thus give unity to all of the four-year curricula offered in the institution. Ten of these are in charge of this division, and some of them, by means of electives and options, are susceptible of manifold modification and application.

CURRICULUM IN GENERAL SCIENCE

The curriculum in general science includes the fundamental training in English, mathematics, science, history, economics, military science, and physical training required in the several specialized vocational courses now offered by the College. Its required subjects constitute the central educational basis of the institution. By means of a number of groups of electives, it gives an opportunity to students to advance themselves still further in these fundamental lines and to give special attention to some, instead of taking the technical subjects characterizing other courses. This opportunity meets the needs of several types of young people, among whom are: (1) Those who have not yet fully decided as to their vocation, but who wish an education that is strong and well balanced in respect to modern science and cultural subjects, as a foundation for further education or as a preparation for sound citizenship, and intellectual, esthetic and ethical satisfaction in life. (2) Those who are looking forward to teaching in the high schools of the state. The electives offered allow one to give special attention to mathematics, physical science, biological science, agriculture, home economics, history, economics, English, journalism, music, professional educational subjects, and several other lines. (3) Those who are fitting themselves for research work in the sciences, especially as applied to agriculture, engineering, and other industries. (4) Those for whom a good general education is required or desirable before studying a profession such as law or medicine.

The elective groups offered in this curriculum are to a considerable extent made up of studies required in one or more of the specialized curricula. They provide, also, advanced work not included in the other curricula. The scientific work in connection with the Agricultural and Engineering Experiment Stations, and several fields of state investigation and service, calls for the operation of unusually well-equipped departments in the sciences, and excellent facilities for practical training in this work are thus afforded.

While the curriculum in general science offers a wide choice of electives,

these may not be selected aimlessly, or with the idea of choosing the easiest, or of obtaining credit for miscellaneous subjects taken elsewhere or in other curricula. The studies of the freshman and sophomore years are basic and are required of all, without exception. They insure a broad and adequate foundation for subsequent work in the several lines of electives. The electives are to be chosen in groups, approved by the Faculty or by the dean of the Division of General Science, and in such a manner as to give logical coherence to the curriculum as a whole. The elective portion of the curriculum, as thus made up, consists for the most part of several groups of two or more full studies or their equivalent. It is possible to include some single subjects that may be advantageously taken without others. Special combinations in home economics and mechanic arts have been planned to meet the needs of prospective teachers of household arts and manual training. Students changing from other curricula to that in general science receive credit for work done in the other curricula in so far as it can be fitted into the general plan of this one.

The curriculum in general science is thus many in one. Such various combinations of groups are possible that it is not practicable to print all of them in extended form. There are, therefore, formally presented here the required subjects of the curriculum in their specified order by years and semesters, and on later pages a considerable number of groups of electives. Most of these groups may be considerably extended by including other acceptable subjects.

CURRICULUM IN INDUSTRIAL JOURNALISM

Knowledge is power only as it comes into the possession of those who can use it; it gives pleasure in direct proportion to the extent of its diffusion. A discovery is of little value as long as the discoverer is the only one who knows of its existence, and the printed page is by far the most effective means of extending knowledge concerning it. Magazines and newspapers never sleep, nor do they take vacations, and their power to elevate mankind is incalculable. But printed knowledge becomes effective only as it is read, and to be widely read in this day it must stand out from the great mass of other matter and gain the attention and hold the interest of the reader. To do this its points must be sharp and easily seen, and the style must be attractive. On the other hand, if the presentation is not essentially true, the more attractive it is the worse it is, and the greater the harm that follows wide reading of it.

The curriculum in industrial journalism endeavors to give young men and women training which will enable them to write both truthfully and effectively, particularly upon industrial subjects. To such subjects the modern newspaper and the general magazine are giving constantly more attention while there are also 500 agricultural publications and a greater number of class and trade publications which are largely or exclusively concerned with matters relating to industrial life. The training given by the College has enabled a goodly number of alumni to do successful work upon these publications.

The aim of the curriculum is to present such subjects as will enable the writer to see his work in proper perspective, to obtain authoritative knowledge of some field of industrial activity, and to write acceptably. The curriculum consequently offers, in the first place, fundamental studies of literary, social, and scientific character. Because of the materials with which journalism deals, it is highly desirable that the student obtain a clear knowledge of the social sciences and be able to read at least one current foreign language. In the second place, the student is required to elect subjects in agriculture, mechanic arts, applied science, or home economics, depending on the portion of the field of industrial journalism which he desires to enter, it being expected that every student graduated from the curriculum shall have special knowledge of some prominent line of industry. In the third place, the theory and practice of journalism are presented in a series of courses extending throughout the sophomore, junior, and senior years, and opportunity is offered for taking additional electives in journalism simultaneously with the required courses.

The College thus affords preparation for work in a wide and inviting field. Our unprecedented industrial achievements have been made by the applica-

tion of discoveries in physical and biological science. Much of discovery and much of application are yet to come, and one who can write truthfully and attractively of that which is, and of that which comes, will find ample reward.

CURRICULUM IN INDUSTRIAL CHEMISTRY

The facilities for instruction in chemistry are ample, and the demand of students for a curriculum planned especially to give chemical training is such that a formulation has been made to meet the needs of those desiring to specialize in industrial chemistry. A curriculum in chemical engineering is also offered in the Division of Engineering. The instructional facilities of the Department of Chemistry, reinforced by opportunities for practical work in connection with the researches of the experiment stations, are such as to provide amply for this specialized training.

CURRICULA IN MUSIC

A knowledge of music contributes to the satisfaction in life of practically all cultivated people. This College throughout its history has maintained a department of music for the purpose of affording culture in this art to any of its students. In recent years the excellence of the instruction offered has created a demand for curricula in music.

Four-year curricula are offered in voice, piano, and violin, and the last may be adapted to the needs of students who adopt some other major instrument. Curricula are also offered in public-school music, with specialization in either voice or instrument, and in public-school band and orchestra. Students completing one of these four-year curricula are awarded the degree of Bachelor of Music, and are eligible to receive a three-year state certificate, renewable for life.

A student completing the first two years of the curriculum in public-school music is awarded a certificate, and becomes eligible to receive from the State Board of Education a three-year state certificate as teacher or supervisor of public-school music. This certificate is renewable for three-year periods.

The curriculum in public-school band and orchestra is designed to train the student in the practical problems of amateur and semi-professional bands and orchestras. The curriculum is comprehensive in that it provides for sixty-five hours of general college work in addition to the general courses in the theory of music, and also specific preparation in the organizing, managing and conducting of bands and orchestras. The courses in dramatic production should prepare the student to produce and direct operettas.

CURRICULA IN PHYSICAL EDUCATION

Within recent years a great awakening has taken place in respect to physical development. The prevalence of bodily conditions and defects that systematic and intelligently directed exercise would have corrected has been found to be serious. Since this situation has been recognized there has been in schools of all grades a great increase in the provision for physical education and training. Success in this work requires vigorous health, a normal condition of the hands, feet, joints, muscles and internal organs, and eyes that do not require glasses. The curricula offered at this institution are designed to prepare teachers of physical education who are fundamentally trained. This is a much broader field than mere coaching of athletics. At the same time it is fully recognized that the impulse to play is instinctive, and that wisely chosen games, conducted under adequate supervision, constitute attractive and effective agencies for physical development. The theoretical and practical instruction given in these curricula amply prepares students for coaching athletic games. The curricula are also so planned as to enable the student to get the work in professional education necessary for a state certificate, and to elect work in English, mathematics, history or some other subject which one may teach in connection with physical education in the smaller schools.

CURRICULUM IN RURAL COMMERCE

The commercial prosperity of Kansas depends primarily upon the business success of its farming population. The success of the farmer is determined to a large extent by his relations with those who handle his products or furnish him with goods and services. The towns of the state and the strictly rural districts about them constitute an economic unit, the members of which are mutually dependent. A knowledge of the economic, financial, social, and business principles affecting the country and the towns in themselves and in their interrelations is of the greatest importance. The curriculum in rural commerce is designed primarily to train men and women for citizenship and business service in these communities.

The completion of this curriculum should not only enable one to conduct his own business more successfully, but give him an insight into the problems of others in their occupations. A general diffusion of such knowledge promotes tolerance, consideration for the general public with which each deals, and social unity.

Choice of electives is rather free in this curriculum, and any agricultural, industrial, commercial or social subjects of study will be approved if they are chosen in such relationships as to give promise of usefulness.

SIX-YEAR CURRICULUM IN GENERAL SCIENCE AND VETERINARY MEDICINE

A six-year curriculum has been formulated which combines many of the advantages of a course of general scientific study with preparation for the profession of veterinary medicine. During the first four years science work of a general character is combined with subjects fundamental in veterinary medicine, and on completion of these four years the degree of Bachelor of Science is conferred. The last two years are given almost exclusively to professional veterinary subjects, and complete the requirements for the degree of Doctor of Veterinary Medicine.

SPECIAL COURSES FOR TEACHERS

At the present time teaching of vocational subjects in the public schools is undergoing great development. Many schools are introducing manual training, agriculture, food and nutrition, and clothing and textiles, and many others are extending the work hitherto given. The state law requiring the teaching of agriculture in the rural schools is also creating a strong movement in the same direction. There is an active demand for teachers who can handle such work successfully.

The college offers to graduates of other institutions, and indeed to all who have studied such subjects as may be prerequisite, unexcelled facilities for securing training in the industrial subjects indicated. Courses extending over one or two years may be arranged by means of which the student who is already prepared in English, mathematics, and to a certain extent in the sciences, may prepare himself to enter a broader and, frequently, a more remunerative field.

Nos. 31, 32, 35, 36 and 37 of the groups of electives illustrate the possibilities in work of this character, and other arrangements may be made. Those taking such courses will be cared for in the regular classes provided for other students, and no limitation is imposed except that the prerequisites for any subject must have been taken previously, here or elsewhere. These prerequisites are stated in this catalogue in connection with the description of each subject. The catalogue also shows the semester in which a subject is regularly given.

The conditions and requirements for the different classes of state certificates are stated in the introductory paragraphs for the Department of Education.

The course for persons who wish to prepare for teaching vocational agriculture under the Smith-Hughes law is outlined under the Division of Agriculture, and the course for those wishing to qualify as teachers of vocational home economics, under the same law, is given under the Division of Home Economics.

Curriculum in General Science

In effect September, 1928, for class of 1931 and later classes.

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)*	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chemistry 102	5(3-6)
Plane Trigonometry ‡ Math. 101	3(3-0)	College Algebra ‡ Math. 104	3(3-0)
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Current History Hist. 126	1(1-0)	Current History Hist. 126	1(1-0)
Library Methods Lib. Ec. 101	1(1-0)	Elective†	2(-)
Infantry I (Men) Mil. Tr. 101	1½(0-4)	Infantry II (Men) Mil. Tr. 102	1½(0-4)
Physical Education M (Men) Phys. Ed. 103	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total	16 or 17½	Total	17 or 18½

SOPHOMORE

First Semester		Second Semester	
English Literature Engl. 172	3(3-0)	American Literature Engl. 175	3(3-0)
English History Hist. 121	3(3-0)	Modern Europe II Hist. 223	3(3-0)
General Physics I Physics 135	4(3-3)	General Physics II Physics 140	4(3-3)
General Zoölogy Zoöl. 105	5(3-6)	Psychology A Educ. 101	3(3-0)
Elective†	2(-)	Elective †	3(-)
Infantry III (Men) Mil. Tr. 103	1½(0-4)	Infantry IV (Men) Mil. Tr. 104	1½(0-4)
Physical Education M (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
Total	17 or 18½	Total	16 or 17½

JUNIOR

First Semester		Second Semester	
History of English Literature Engl. 181	3(3-0)	American History I Hist. 201	3(3-0)
American Government Hist. 151, 152 *or* 153	3(3-0)	Economics Econ. 101	3(3-0)
Extempore Speech I Pub. Spk. 106	2(2-0)	General Microbiology Bact. 101	3(1-6)
Elective†	8(-)	Elective†	7(-)
Total	16	Total	16

SENIOR

First Semester		Second Semester	
Elective†	16(-)	Elective†	16(-)

Summary.—Men: Physical education, two years, required; military science, 6 hours; other prescribed subjects, 76 hours; elective 54 hours; total 136 semester hours. Women: The same, except no military science. Total, 130 semester hours.

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* The number before the parenthesis indicates the number of semester hours of credit; the first number within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in the laboratory each week; and the third, where there is such, indicates the number of hours of outside work in connection with the laboratory each week.

† Electives are to be chosen, with the advice and approval of the dean, in groups of not less than eight semester credits, or in courses which extend fields already entered in the required work.

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing trigonometry, current history, and library methods until the second semester. The additional credits are applied against electives.

Curriculum in Industrial Journalism

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
French I Mod. Lang. 151	3(3-0)*or*	French II Mod. Lang. 152	3(3-0)*or*
Spanish I Mod. Lang. 176	3(3-0)	Spanish II Mod. Lang. 177	3(3-0)
		Library Methods Lib. Ec. 101	1(1-0)
Current History Hist. 126	1(1-0)	Current History Hist. 126	1(1-0)
Option related to an industry or to applied science†	4(-)	Option related to an industry or to applied science†	4(-)
Industrial Journalism Lecture	R	Industrial Journalism Lecture	R
Infantry I (Men) Mil. Tr. 101	1½(0-4)	Infantry II (Men) Mil. Tr. 102	1½(0-4)
Physical Education M (Men) Phys. Ed. 103	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total	16 or 17½	Total	17 or 18½

SOPHOMORE

First Semester		Second Semester	
English Literature Engl. 172	3(3-0)	American Literature Eng. 175	3(3-0)
General Zoölogy Zoöl. 105	5(3-6)*or*	General Botany II Bot. 105	3(1-4, 2)*or*
General Botany I Bot. 101	3(1-4, 2)	General Microbiology Bact. 101	3(1-6)*if*
		General Botany I is chosen the first semester.	
Principles of Typography I Ind. Jour. 101	3(2-3)	Principles of Typography II Ind. Jour. 105	1(0-3)
Elementary Journalism Ind. Jour. 151	2(2-0)	Industrial Writing Ind. Jour. 161	2(2-0)
Journalism Practice I Ind. Jour. 154	2(0-6)	Journalism Practice II Ind. Jour. 155	2(0-6)
Option related to an industry or to applied science†	2 or 4(-)	Option related to an industry or to applied science†	9 or 6(-)
Industrial Journalism Lectures	R	Industrial Journalism Lectures	R
Infantry III (Men) Mil. Tr. 103	1½(0-4)	Infantry IV (Men) Mil. Tr. 104	1½(0-4)
Physical Education M (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 164	R(0-3)
Total	17 or 18½	Total	17 or 18½

JUNIOR

First Semester		Second Semester	
Industrial Feature Writing I Ind. Jour. 167	2(2-0)	Industrial Feature Writing II Ind. Jour. 171	2(2-0)*and*
Journalism Practice III Ind. Jour. 158	2(0-6)	Journalism Practice IV Ind. Jour. 159	2(0-6)*or*
		The Rural Press Ind. Jour. 182	3(3-0)*or*
		Advertising Practice Ind. Jour. 250	2(2-0)
Principles of Advertising Ind. Jour. 179	3(3-0)	Extempore Speech I Pub. Spk. 106	2(2-0)
Copy Reading Ind. Jour. 254	2(0-6)	History of English Literature Engl. 181	3(3-0)
Options and Electives†	7(-)	Options and Electives†	7, 8, or 9(-)
Industrial Journalism Lectures	R	Industrial Journalism Lectures	R
Total	16	Total	16

† (See footnote next page.)

SENIOR

In effect 1926-'27, class of 1927 and later.

First Semester		Second Semester	
Circulation and Advertising Promotion Ind. Jour. 251A	2(2-0)	Editorial Practice Ind. Jour. 257	2(2-0)
Contemporary Thought Ind. Jour. 255	3(3-0)	Ethics of Journalism Ind. Jour. 260	2(2-0)
Electives and Options†	11(-)	Electives and Options†	11(-)
Industrial Journalism Lectures	R	Industrial Journalism Lectures	R
Total	16	Total	15

Summary.—Men: Physical education, two years, required; military science, 6 hours; industrial journalism 33-35 hours; restricted options, 36 hours; modern language, 6 hours; other prescribed subjects, 35 or 36 hours; general electives, 18 to 21 hours; total, 136 semester hours. Women: The same, excepting no military science; total, 130 semester hours.

Curriculum in Industrial Chemistry

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
Plane Trigonometry‡ Math. 101	3(3-0)	College Algebra‡ Math. 104	3(3-0)
Engineering Drawing Mach. Design 101	2(0-6)	Descriptive Geometry Mach. Design 106	2(0-6)
Commercial Law Hist. 160	1(1-0)	Machine Drawing I Mach. Design 111	2(0-6)
Engineering Woodwork I Shop 101	1(0-3)	Library Methods Lib. Econ. 101	1(1-0)
Forging I Shop 150	1(0-3)		
Infantry I (Men) Mil. Tr. 101	1½(0-4)	Infantry II (Men) Mil. Tr. 102	1½(0-4)
Physical Education M (Men) Phys. Ed. 103	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total	16 or 17½	Total	16 or 17½

† The options and electives are chosen with the advice and approval of the dean. The options are in two general groups, of eighteen semester credits each: (1) social science, and (2) courses related to an industry or applied science. The options taken in the freshman year, and a large part of those in the sophomore year, must be those related to an industry or applied science. In the tabulated presentation of electives for students in the Division of General Science, groups may be found that will be accepted as the required options and electives. These are printed immediately following the presentation of the curricula. Group 31 (applied science), group 32 (home economics), group 35 (agriculture), group 36 (architecture), or group 37 (manual training), may be chosen in satisfaction of the eighteen hours required related to an industry or applied science. From group 30, eighteen hours are to be chosen in satisfaction of the social science option.

The electives are to be chosen in groups of usually not fewer than eight semester credits, unless they are courses which extend fields already entered through the required subjects or the options.

‡ Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing trigonometry, current history, and library methods until the second semester. The additional credits are applied against electives.

SOPHOMORE

First Semester		Second Semester	
Organic Chemistry I Chem. 218	4(2-6)	Organic Chemistry II Chem. 219	4(2-6)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus Math. 119	3(3-0)
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Adv. Inorg. Chemistry Chem. 207	3(3-0)	Quantitative Analysis Chem. 241	5(1-12)
Infantry II (Men) Mil. Tr. 103	1½(0-4)	Infantry IV (Men) Mil. Tr. 104	1½(0-4)
Physical Education M (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
Total	16 or 17½	Total	17 or 18½

JUNIOR

First Semester		Second Semester	
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Inorganic Preparations Chem. 202	2(0-6)	History of Chemistry Chem. 208	1(1-0)
Physical Chemistry Chem. 206	5(3-6)		
Fire Assaying Chem. 242	2(0-6)	Industrial Electrochemistry Chem. 205	2(2-0)
Gas Analysis Chem. 243	1(0-3)	Electrical Engineering C Elect. Engr. 160, 165	3(2-2, 1)
Electives†	3(-)	Electives†	7(-)
Total	16	Total	16

SENIOR

First Semester		Second Semester	
American Government Hist. 151, 152 or 153	3(3-0)	Economics Econ. 101	3(3-0)
Industrial Chemistry I Chem. 203	5(3-6)	Industrial Chemistry II Chem. 204	5(3-6)
Scientific German I Mod. Lang. 237	4(4-0)		
Electives†	4(-)	Electives†	8(-)
Thesis	R	Thesis	R
Total	16	Total	16

Summary.—Men: Physical education, required; military science, 6 hours; chemistry, 49 hours; engineering, 11 hours; other prescribed subjects, 47 hours; elective, 22 hours. Total, 135 semester hours and thesis. Women: The same, except no military science. Total, 129 semester hours and thesis.

† Electives are to be chosen, with the advice and approval of the dean, in groups of not less than eight semester credits, or in courses which extend fields already entered in the required work.

Curriculum in Public-school Music

In effect September, 1927, for class of 1931.

FRESHMAN

First Semester		Second Semester	
Public-school Music I Mus. 120	2(2-0)	Public-school Music II Mus. 121	2(2-0)
Ear Training and Sight Singing I Mus. 105	2(2-0)	Ear Training and Sight Singing II Mus. 106	2(2-0)
Harmony I Mus. 101	2(2-0)	Harmony II Mus. 102	2(2-0)
Piano B-I§ Mus. 174A	1(½-6)	Piano B-II Mus. 174B	1(½-6)
Voice A-I§ Mus. 161A	2(1-6)	Voice A-II Mus. 161B	2(1-6)
		Conducting I Mus. 117	1(1-0)
Chorus I Mus. 190A	R(1-0)	Chorus II Mus. 190B	R(1-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Psychology B Educ. 102	3(3-0)	Extempore Speech I Pub. Spk. 106	2(2-0)
Physical Education W (Women) Phys. Ed. 151A	R(0-3)*or*	Physical Education W (Women) Phys. Ed. 152A	R(0-3)*or*
Infantry I (Men) Mil. Tr. 101	1½(0-4)*and*	Infantry II (Men) Mil. Tr. 102	1½(0-4)*and*
Physical Education M (Men) Phys. Ed. 103	R(0-2)	Physical Education M (Men) Phys. Ed. 104	R(0-2)
Total	15 or 16½	Total	15 or 16½

SOPHOMORE

First Semester		Second Semester	
Public-school Music III Mus. 122	2(2-0)	Public-school Music IV Mus. 123	2(2-0)
Ear Training and Sight Singing III Mus. 107	2(2-0)	Ear Training and Sight Singing IV Mus. 108	2(2-0)
Harmony III Mus. 103	2(2-0)	Harmony IV Mus. 104	2(2-0)
Piano B-III Mus. 174C	1(½-6)	Piano B-IV Mus. 174D	1(½-6)
Voice A-III Mus. 161C	2(1-6)	Voice A-IV Mus. 161D	2(1-6)
Orchestral Instruments I Mus. 142A	1(½-6)	Orchestral Instruments II Mus. 142B	1(½-6)
Chorus III Mus. 190C	R(1-0)	Chorus IV Mus. 190D	R(1-0)
English Literature Engl. 172	3(3-0)	American Literature Engl. 175	3(3-0)
History and Appreciation of Music I Mus. 112	3(3-0)	History and Appreciation of Music II Mus. 113	3(3-0)
Physical Education W (Women) Phys. Ed. 153	R(0-3)*or*	Physical Education W (Women) Phys. Ed. 154	R(0-3)*or*
Infantry III (Men) Mil. Tr. 103	1½(0-4)*and*	Infantry IV (Men) Mil. Tr. 104	1½(0-4)*and*
Physical Education M (Men) Phys. Ed. 105	R(0-2)	Physical Education M (Men) Phys. Ed. 106	R(0-2)
Total	16 or 17½	Total	16 or 17½

§ The relative amounts of vocal and instrumental study in the several years is subject to change on recommendation of the head of the department of music, the total being three semester hours each semester the first two years, and two semester hours each semester of the last two years.

JUNIOR

First Semester		Second Semester	
Public-school Music V Mus. 124	2(2-0)	Public-school Music VI Mus. 125	2(2-0)
Counterpoint Mus. 108A	2(2-0)	Musical Form and Analysis Mus. 109	2(2-0)
Voice or Instrument Mus.	2(-)	Voice or Instrument Mus.	2(-)
		Methods of Teaching Music Mus. 145	1(1-0)
Chorus V Mus. 190E	R(1-0)	Chorus VI Mus. 190F	R(1-0)
A Modern Language	3(3-0)	Modern Language (continued)	3(3-0)
Elective in English	3(3-0)		
Elective in Education	3(3-0)	Elective in Education	3(3-0)
Elective, nonmusic	2(-)	Elective, nonmusic	5(-)
Total	17	Total	18

SENIOR

First Semester		Second Semester	
Public-school Music VII Mus. 126	2(2-0)	Public-school Music VIII Mus. 127	2(2-0)
Instrumentation Mus. 130	2(2-0)	Orchestration Mus. 133	2(2-0)
Voice or Instrument Mus.	2(-)	Voice or Instrument Mus.	2(-)
Practice Teaching of Music Mus. 188	2(-)		
Chorus VII Mus. 190G	R(1-0)	Chorus VIII Mus. 190H	R(1-0)
Modern Language (continued)	3(3-0)	Modern Language (continued)	3(3-0)
Elective in Education	3(3-0)	Elective in Education	6(6-0)
Elective, nonmusic	3(-)	Elective, nonmusic	3(-)
Total	17	Total	18

Summary.—Women: Physical education, required; music, 72 hours; other prescribed subjects, 14 hours; electives in education, 18 hours; electives in one modern language, 12 hours; general electives, 16 hours; total, 132 semester hours. Men: The same, except that military science, 6 hours, is also required. Total, 138 semester hours.

Curriculum in Public-school Music

Adaptation for Class of 1929

SENIOR, 1928-'29

The same as for the class of 1931.

Students in this class, if time permits, should elect additional nonmusic subjects in order to qualify for a general state teacher's certificate.

Adaptation for Class of 1930

JUNIOR AND SENIOR, 1928-'29 AND 1929-'30.

The same as for the class of 1931, excepting that American Literature, 3(3-0), replaces a three-hour elective in education. An additional nonmusic three-hour elective beyond the stated requirements should be taken if possible by those seeking a general state certificate.

Curriculum in Voice

In effect September, 1927, classes of 1931 and later years.

FRESHMAN

First Semester		Second Semester	
Voice I Mus. 160A	4(1-12)	Voice II Mus. 160B	4(1-12)
History and Appreciation of Music I Mus. 112	3(3-0)	History and Appreciation of Music II Mus. 113	3(3-0)
Current History Hist. 126	1(1-0)	Current History Hist. 126	1(1-0)
		Library Methods Lib. Ec. 101	1(1-0)
Harmony I Mus. 101	2(2-0)	Harmony II Mus. 102	2(2-0)
Ear Training and Sight Singing I Mus. 105	2(2-0)	Ear Training and Sight Singing II Mus. 106	2(2-0)
Ensemble I Mus. 190A, 193A, *or* 196A,	R(1-0)	Ensemble II Mus. 190B, 193B, *or* 196B,	R(1-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Infantry I (Men) Mil. Tr. 101	1½(0-4)	Infantry II (Men) Mil. Tr. 102	1½(0-4)
Physical Education M (Men) Phys. Ed. 103	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total	15 or 16½	Total	16 or 17½

SOPHOMORE

In effect for classes of 1930 and later years.

First Semester		Second Semester	
Voice III Mus. 160C	4(1-12)	Voice IV Mus. 160D	4(1-12)
Piano A-I Mus. 172A	2(1-6)	Piano A-II Mus. 172B	2(1-6)
Harmony III Mus. 103	2(2-0)	Harmony IV Mus. 104	2(2-0)
Ensemble III Mus. 190C, 193C, *or* 196C,	R(1-0)	Ensemble IV Mus. 190D, 193D, *or* 196D,	R(1-0)
Recital I Mus. 184A	R(-)	Recital II Mus. 184B	R(-)
English Literature Engl. 172	3(3-0)	Harmonics Physics 222	2(2-0)
Psychology B Educ. 102	3(3-0)	American Literature Engl. 175	3(3-0)
Elective, nonmusic	2(-)	Elective, nonmusic	3(-)
Infantry III (Men) Mil. Tr. 103	1½(0-4)	Infantry IV (Men) Mil. Tr. 104	1½(0-4)
Physical Education M (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
Total	16 or 17½	Total	16 or 17½

JUNIOR

In effect for classes of 1929 and later years.

First Semester		Second Semester	
Voice V Mus. 160E	4(1-12)	Voice VI Mus. 160F	4(1-12)
Methods of Teaching Music Mus. 145	1(1-0)	Practice Teaching of Music Mus. 188	2(2-0)
Counterpoint Mus. 108A	2(2-0)	Musical Form and Analysis Mus. 109	2(2-0)
Ensemble V Mus. 190E, 193E, *or* 196E,	R(1-0)	Ensemble VI Mus. 190F, 193F, *or* 196F,	R(1-0)
Recital III Mus. 184C	R(-)	Recital IV Mus. 184D	2(2-0)
Piano A-III Mus. 172C	2(1-6)	Piano A-IV Mus. 172D	2(1-6)
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Conducting I Mus. 117	1(1-0)		
Elective, nonmusic	4(4-0)	Elective, nonmusic	2(-)
Total	17	Total	17

SENIOR

In effect for classes of 1928 and later years.

First Semester		Second Semester	
Voice VII Mus. 160G	4(1-12)	Voice VIII Mus. 160H	4(1-12)
Instrumentation Mus. 130	2(2-0)	Orchestration Mus. 133	2(2-0)
Ensemble VII Mus. 190G, 193G, *or* 196G,	R(1-0)	Ensemble VIII Mus. 190H, 193H, *or* 196H,	R(1-0)
Recital V Mus. 184E	R(-)	Recital VI Mus. 184F	2(2-0)
Educational Psychology Educ. 109	3(3-0)		
French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 152	3(3-0)
Repertoire I Mus. 186A	2(2-0)	Repertoire II Mus. 186B	2(2-0)
Elective, nonmusic	3(-)	Elective, nonmusic	3(-)
Total	17	Total	16

Summary.—Women: Physical education, required; music, 78 hours; education, 6 hours; other prescribed subjects, 29 hours; elective, 17 hours. Total, 130 semester hours. Men: The same except that military science, 6 hours, is required. Total, 136 semester hours.

Curriculum in Piano

In effect September, 1927, classes of 1931 and later years.

FRESHMAN

First Semester		Second Semester	
Piano I		Piano II	
Mus. 170A	4(1-12)	Mus. 170B	4(1-12)
Harmony I		Harmony II	
Mus. 101	2(2-0)	Mus. 102	2(2-0)
Ear Training and Sight Singing I		Ear Training and Sight Singing II	
Mus. 105	2(2-0)	Mus. 106	2(2-0)
Ensemble I		Ensemble II	
Mus. 190A, 193A, *or* 196A,	R(1-0)	Mus. 190B, 192B, *or* 196B,	R(1-0)
College Rhetoric I		College Rhetoric II	
Engl. 101	3(3-0)	Engl. 104	3(3-0)
History and Appreciation of Music I		History and Appreciation of Music II	
Mus. 112	3(3-0)	Mus. 113	3(3-0)
Current History		Current History	
Hist. 126	1(1-0)	Hist. 126	1(1-0)
		Library Methods	
		Lib. Ec. 101	1(1-0)
Piano Ensemble I		Piano Ensemble II	
Mus. 176A	R(1-0)	Mus. 176B	R(1-0)
Infantry I (Men)		Infantry II (Men)	
Mil. Tr. 101	1½(0-4)	Mil. Tr. 102	1½(0-4)
Physical Education M (Men)		Physical Education M (Men)	
Phys. Ed. 103	R(0-2)*or*	Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women)		Physical Education W (Women)	
Phys. Ed. 151A	R(0-3)	Phys. Ed. 152A	R(0-3)
Total	15 or 16½	Total	16 or 17½

SOPHOMORE

In effect for classes of 1930 and later years.

First Semester		Second Semester	
Piano III		Piano IV	
Mus. 170C	4(1-12)	Mus. 170D	4(1-12)
Voice A-I		Voice A-II	
Mus. 161A	2(1-6)	Mus. 161B	2(1-6)
Harmony III		Harmony IV	
Mus. 103	2(2-0)	Mus. 104	2(2-0)
Ensemble III		Ensemble IV	
Mus. 190C, 193C, *or* 196C,	R(1-0)	Mus. 190D, 193D, *or* 196D,	R(1-0)
Recital I		Recital II	
Mus. 184A	R(-)	Mus. 184B	R(-)
English Literature		Harmonics	
Engl. 172	3(3-0)	Physics 222	2(2-0)
Psychology B		American Literature	
Educ. 102	3(3-0)	Engl. 175	3(3-0)
Piano Ensemble III		Piano Ensemble IV	
Mus. 176C	R(1-0)	Mus. 176D	R(1-0)
Elective, nonmusic	2(-)	Elective, nonmusic	3(-)
Infantry II (Men)		Infantry IV (Men)	
Mil. Tr. 103	1½(0-4)	Mil. Tr. 104	1½(0-4)
Physical Education M (Men)		Physical Education M (Men)	
Phys. Ed. 106	R(0-2)*or*	Phys. Ed. 105	R(0-2)*or*
Physical Education W (Women)		Physical Education W (Women)	
Phys. Ed. 153	R(0-3)	Phys. Ed. 154	R(0-3)
Total	**16 or 17½**	Total	16 or 17½

JUNIOR

In effect for classes of 1929 and later years.

First Semester		Second Semester	
Piano V		Piano VI	
Mus. 170E	4(1-12)	Mus. 170F	4(1-12)
Counterpoint		Musical Form and Analysis	
Mus. 108A	2(2-0)	Mus. 109	2(2-0)
Ensemble V		Ensemble VI	
Mus. 190E, 193E, *or* 196E,	R(1-0)	Mus. 190F, 193F, *or* 196F,	R(1-0)
Recital III		Recital IV	
Mus. 184C	R(-)	Mus. 184D	2(2-0)
German I		German II	
Mod. Lang. 101	3(3-0)	Mod. Lang. 102	3(3-0)
Normal Piano Methods		Practice Teaching in Music	
Mus. 140	2(2-0)	Mus. 188	2(2-0)
Piano Ensemble V		Piano Ensemble VI	
Mus. 176E	R(1-0)	Mus. 176F	R(1-0)
Conducting I			
Mus. 117	1(1-0)		
Elective, nonmusic	5(-)	Elective, nonmusic	3(-)
Total	17	Total	16

SENIOR

In effect for classes of 1928 and later years.

First Semester		Second Semester	
Piano VII		Piano VIII	
Mus. 170G	4(1-12)	Mus. 170H	4(1-12)
Instrumentation		Orchestration	
Mus. 130	2(2-0)	Mus. 133	2(2-0)
Ensemble VII		Ensemble VIII	
Mus. 190G, 193G, *or* 196G,	R(1-0)	Mus. 190H, 193H, *or* 196H,	R(1-0)
Recital V		Recital VI	
Mus. 184E	R(-)	Mus. 184F	2(2-0)
Educational Psychology			
Educ. 109	3(3-0)		
French I		French II	
Mod. Lang. 151	3(3-0)	Mod. Lang. 152	3(3-0)
Piano Ensemble VII		Piano Ensemble VIII	
Mus. 176G	R(1-0)	Mus. 176H	R(1-0)
Elective, nonmusic	5(-)	Elective, nonmusic	6(-)
Total	17	Total	17

Summary.—Women: Physical education, required; music, 71 hours; education, 6 hours; other prescribed subjects, 29 hours; elective, 24 hours. Total, 130 semester hours. Men: The same, except that military science, 6 hours, is also required. Total, 136 semester hours.

Curriculum in Violin

In effect September, 1927, classes of 1931 and later years.

FRESHMAN

First Semester		Second Semester	
Violin I Mus. 165A	4(1-12)	Violin II Mus. 165B	4(1-12)
Harmony I Mus. 101	2(2-0)	Harmony II Mus. 102	2(2-0)
History and Appreciation of Music I Mus. 112	3(3-0)	History and Appreciation of Music II Mus. 113	3(3-0)
Current History Hist. 126	1(1-0)	Current History Hist. 126	1(1-0)
		Library Methods Lib. Ec. 101	1(1-0)
Ear Training and Sight Singing I Mus. 105	2(2-0)	Ear Training and Sight Singing II Mus. 106	2(2-0)
Ensemble I Mus. 190A, 193A, *or* 196A,	R(1-0)	Ensemble II Mus. 190B, 193B, *or* 196B,	R(1-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Infantry I (Men) Mil. Tr. 101	1½(0-4)	Infantry II (Men) Mil. Tr. 102	1½(0-4)
Physical Education M (Men) Phys. Ed. 103	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total	15 or 16½	Total	16 or 17½

SOPHOMORE

In effect for classes of 1930 and later years.

First Semester		Second Semester	
Violin III Mus. 165C	4(1-12)	Violin IV Mus. 165D	4(1-12)
Piano A-I Mus. 172A	2(1-6)	Piano A-II Mus. 172B	2(1-6)
Harmony III Mus. 103	2(2-0)	Harmony IV Mus. 104	2(2-0)
Ensemble III Mus. 190C, 193C, *or* 196C,	R(1-0)	Ensemble IV Mus. 190D, 193D, *or* 196D,	R(1-0)
Recital I Mus. 184A	R(-)	Recital II Mus. 184B	R(-)
English Literature Engl. 172	3(3-0)	Harmonics Physics 222	2(2-0)
Psychology B Educ. 102	3(3-0)	Educational Psychology Educ. 109	3(3-0)
Elective, nonmusic	2(-)	Elective, nonmusic	3(-)
Infantry III (Men) Mil. Tr. 103	1½(0-4)	Infantry IV (Men) Mil. Tr. 104	1½(0-4)
Physical Education M (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
Total	16 or 17½	Total	16 or 17½

JUNIOR

In effect for classes of 1929 and later years.

First Semester		Second Semester	
Violin V Mus. 165E	6(1-24)	Violin VI Mus. 165F	6(1-24)
Counterpoint Mus. 108A	2(2-0)	Musical Form and Analysis Mus. 109	2(2-0)
Ensemble V Mus. 190E, 193E, *or* 196E,	R(1-0)	Ensemble VI Mus. 190F, 193F, *or* 196F,	R(1-0)
Recital III Mus. 184C	R(-)	Recital IV Mus. 184D	2(2-0)
Piano A-III Mus. 172C	2(1-6)	Piano A-IV Mus. 172D	2(1-6)
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Methods of Teaching Music Mus. 145	1(1-0)	Practice Teaching of Music Mus. 188	2(2-0)
Conducting I Mus. 117	1(1-0)		
Elective, nonmusic	2(-)	Elective, nonmusic	1(-)
Total	17	Total	18

SENIOR

In effect for class of 1928.

First Semester		Second Semester	
Violin VII Mus. 165G	6(1-24)	Violin VIII Mus. 165H	6(1-24)
Instrumentation Mus. 130	2(2-0)	Orchestration Mus. 133	2(2-0)
Ensemble VII Mus. 190G, 193G, *or* 196G,	R(1-0)	Ensemble VIII Mus. 190H. 193H, *or* 196H,	R(1-0)
Recital V Mus. 184E	R(-)	Recital VI Mus. 184F	2(2-0)
French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 152	3(3-0)
Educational Psychology Educ. 109	3(3-0)		
Elective, nonmusic	3(-)	Elective, nonmusic	3(3-0)
Total	17	Total	16

Summary.—Women: Physical education, required; music, 82 hours; education, 6 hours; other prescribed subjects, 28 hours; elective, 14 hours. Total, 130 semester hours. Men: The same, except that military science, 6 hours, is also required. Total, 136 semester hours.

Curriculum in Public-school Band and Orchestra

In effect September, 1927.

FRESHMAN

First Semester		Second Semester	
Instrument I Mus. 137A	3(1-9)	Instrument II Mus. 137B	3(1-9)
Piano A-I Mus. 172A	2(1-6)	Piano A-II Mus. 172B	2(1-6)
Harmony I Mus. 101	2(2-0)	Harmony II Mus. 102	2(2-0)
Ear Training and Sight Singing I Mus. 105	2(2-0)	Ear Training and Sight Singing II Mus. 106	2(2-0)
Ensemble I (Band *or* Orchestra) Mus. 193A *or* 196A	R(1-0)	Ensemble II (Band *or* Orchestra) Mus. 193B, *or* 196B	R(1-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Psychology B Educ. 102	3(3-0)	Survey of Public-school Music Mus. 110	2(2-0)
		Extempore Speech I Pub. Spk. 106	2(2-0)
Infantry I (Men) Mil. Tr. 101	1½(0-4)*and*	Infantry II (Men) Mil. Tr. 102	1½(0-4)*and*
Physical Education M (Men) Phys. Ed. 103	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total	15 or 16½	Total	16 or 17½

SOPHOMORE

First Semester		Second Semester	
Instrument III Mus. 137C	3(1-9)	Instrument IV Mus. 137D	3(1-9)
Orchestral Instruments I Mus. 142A	1(½-6)	Orchestral Instruments II Mus. 142B	1(½-6)
Ensemble III (Band *or* Orchestra) Mus. 193C *or* 196C	R(1-0)	Ensemble IV (Band *or* Orchestra) Mus. 193D *or* 196D	R(1-0)
Harmony III Mus. 103	2(2-0)	Harmony IV Mus. 104	2(2-0)
Ear Training and Sight Singing III Mus. 107	2(2-0)	Ear Training and Sight Singing IV Mus. 108	2(2-0)
History and Appreciation of Music I Mus. 112	3(3-0)	History and Appreciation of Music II Mus. 113	3(3-0)
English Literature Engl. 172	3(3-0)	American Literature Engl. 175	3(3-0)
Conducting I Mus. 117	1(1-0)	Elective, nonmusic	2
Infantry III (Men) Mil. Tr. 103	1½(0-4)*and*	Infantry IV (Men) Mil. Tr. 104	1½(0-4)*and*
Physical Education M (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
Total	15 or 16½	Total	16 or 17½

JUNIOR

First Semester		Second Semester	
Instrument V Mus. 137E	3(1-9	Instrument VI Mus. 137F	2(1-6)
Counterpoint Mus. 108A	2(2-0)	Musical Form and Analysis Mus. 109	2(2-0)
Instrumentation Mus. 130	2(2-0)		
Ensemble V (Orchestra) Mus. 193E	1(1-0)	Ensemble VI (Orchestra) Mus. 193F	1(1-0)
Conducting II Mus. 128	1(1-0)	Harmonics Physics 222	2(2-0)
Dramatic Production I Pub. Spk. 130	2(2-0)	Dramatic Production II Pub. Spk. 135	2(2-0)
Modern Language I (French or German) Mod. Lang. 101 *or* 151	3(3-0)	Modern Language II Mod. Lang. 102 *or* 152	3(3-0)
Educational Administration A Educ. 105	3(3-0)	Educational Psychology Educ. 109	3(3-0)
		Elective, nonmusic	3(3-0)
Total	17	Total	18

SENIOR

First Semester		Second Semester	
Instrument VII Mus. 137G	2(1-6)	Instrument VIII Mus. 137H	1(½-6)
Orchestral Repertoire I Mus. 144A	1(1-0)	Orchestral Repertoire II Mus. 144B	1(1-0)
Orchestration Mus. 133	2(2-0)		
Conducting III Mus. 129	1(1-0)	Practice Conducting Mus. 135	1(½-2)
Ensemble VII (Orchestra) Mus. 193G	1(1-0)	Ensemble VIII (Orchestra) Mus. 193H	1(1-0)
Chorus Mus.	R(1-0)	Practice Teaching of Music Mus. 188	2(2-0)
Modern Language (continued)	3(3-0)	Modern Language (continued)	3(3-0)
Elective in Education	3(3-0)	Elective in Education	6(6-0)
Elective, nonmusic	3(3-0)	Elective, nonmusic	2(2-0)
Total	16	Total	17

Summary.—Men: Physical education, required; military science, 6 hours; music, 70 hours; education, 18 hours; other prescribed subjects, 32 hours; nonmusic electives, 10 hours. Total, 136 semester hours. Women: The same, except that military science is not required. Total, 130 semester hours.

Curriculum in Physical Education for Men

In effect September, 1928, for the class of 1931 and later years.

FRESHMAN

First Semester		Second Semester	
Gymnastics I Phys. Ed. 115A	2(1-3)	Gymnastics II Phys. Ed. 117A	2(0-6)
Football I Phys. Ed. 126A	2(1-3)	Track and Field Sports Phys. Ed. 140A	2(1-3)
Basket Ball Phys. Ed. 130A	2(1-3)	Boxing Phys. Ed. 132	1(0-3)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
General Chemistry Chem. 110	5(3-6)	Elementary Organic Chemistry Chem. 123	3(2-3)
Extempore Speech I Pub. Spk. 106	2(2-0)	Library Methods Lib. Ec. 101	1(1-0)
		General Zoölogy Zoöl. 105	5(3-6)
Infantry I Mil. Tr. 101	1½(0-4)	Infantry II Mil. Tr. 102	1½(0-4)
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	17½	Total	18½

SOPHOMORE

First Semester		Second Semester	
Personal Hygiene Phys. Ed. 119	2(2-0)	Extempore Speech II Pub. Spk. 108	2(2-0)
Football II Phys. Ed. 127	2(1-3)	Baseball Phys. Ed. 135A	2(1-3)
Swimming M-I Phys. Ed. 121	1(0-3)	Swimming M-II Phys. Ed. 122	1(0-3)
Human Anatomy Zoöl. 123A	5(3-6)	Kinesiology Phys. Ed. 141B	3(3-0)
Embryology A Zoöl. 135	3(2-3)	Physiology A Zoöl. 127	3(2-3)
Psychology A Educ. 101	3(3-0)	History and Principles of Physical Education Phys. Ed. 192	3(3-0)
		Playground Management and Games Phys. Ed. 145A	2(2-0)
Infantry III Mil. Tr. 103	1½(0-4)	Infantry IV Mil. Tr. 104	1½(0-4)
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	17½	Total	17½

JUNIOR

First Semester		Second Semester	
School Hygiene Phys. Ed. 196	3(3-0)	General Microbiology Bact. 101	3(1-6)
Sociology Econ. 151	3(3-0)	Wrestling Phys. Ed. 128	1(0-3)
First Aid and Massage Phys. Ed. 113A	3(3-0)	Apparatus Phys. Ed. 109	1(0-3)
Elementary Journalism Ind. Jour. 151	2(2-0)	Organization and Administration of Physical Education M Phys. Ed. 146B	2(2-0)
Journalism Practice I Ind. Jour. 154	2(0-6)	Psychology of Childhood and Adolescense Educ. 208	3(3-0)
Practice Teaching in Physical Education I Phys. Ed. 136	1(0-3)	Practice Teaching in Physical Education II Phys. Ed. 136B	2(0-6)
		Educational Administration A Educ. 105	3(3-0)
Elective†	3(-)	Elective†	3(-)
Total	17	Total	18

† All electives are to be chosen in accordance with the general rules governing electives, and taken in departments other than that of physical education.

SENIOR

First Semester		Second Semester	
Physical Diagnosis and Prescription Phys. Ed. 124A	3(3-0)	Physiology of Exercise Phys. Ed. 123	2(2-0)
Practice Teaching in Physical Education III Phys. Ed. 136C	2(0-6)	Practice Teaching in Physical Education IV Phys. Ed. 136D	2(0-6)
Educational Psychology Educ. 109	3(3-0)	Methods of Teaching B Educ. 112	3(3-0)
Special Histology Path. 252	3(1-6)	Current History Hist. 126	1(1-0)
		Public School Program in Physical Education Phys. Ed. 142A	2(2-0)
Elective†	4(-)	Elective†	5(-)
Total	15	Total	15

Summary.—Military science, 6 hours; physical education, 50 hours; professional education, 15 hours; other prescribed subjects, 49 hours; general electives, 16 hours. Total, 136 semester hours.

Adaptation for Class of 1929

SENIOR, 1928-'29

The senior year is the same as for the class of 1931, except that current history is omitted, and that sociology replaces three hours of elective, first semester.

Adaptation for Class of 1930

JUNIOR AND SENIOR, 1928-'29 AND 1929-'30

Junior and senior year the same as for class of 1931, except that sociology replaces three hours of elective, first semester, and library methods, one hour of elective second semester, junior year.

Curriculum in Physical Education for Women

In effect September, 1927, for classes of 1931 and later years.

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
Extempore Speech I Pub. Spk. 106	2(2-0)	Extempore Speech II Pub. Spk. 108	2(2-0)
Current History Hist. 126	1(1-0)	General Zoölogy Zoöl. 105	5(3-6)
Library Methods Lib. Econ. 101	1(1-0)		
Hygiene Child Welf. 101	2(2-0)		
Physical Education W Phys. Ed. 151A	R(0-3)	Physical Education W Phys. Ed. 152A	R(0-3)
General Technic of Gymnastics I Phys. Ed. 156A	1(0-3)	General Technic of Gymnastics II Phys. Ed. 156B	1(0-3)
Total	15	Total	16

† All electives are to be chosen in accordance with the general rules governing electives, and taken in departments other than that of physical education.

SOPHOMORE

First Semester		Second Semester	
Elementary Organic Chemistry Chem. 123	3(2-3)	Psychology A Educ. 101	3(3-0)
Human Anatomy Zoöl. 123A	5(3-6)	Kinesiology W Phys. Ed. 189	3(3-0)
English Literature Engl. 172	3(3-0)	American Literature Engl. 175	3(3-0)
Embryology A Zoöl. 135	3(2-3)	Physiology A Zoöl. 127	3(2-3)
Plays and Games Phys. Ed. 181A	1(0-3)	History and Principles of Physical Education Phys. Ed. 192	3(3-0)
First Aid Phys. Ed. 158	1(1-0)	Playground Management W Phys. Ed. 182	1(1-0)
Physical Education W Phys. Ed. 153	R(0-3)	Physical Education W Phys. Ed. 154	R(0-3)
General Technic of Gymnastics III Phys. Ed. 156C	1(0-3)	General Technic of Gymnastics IV Phys. Ed. 156D	1(0-3)
Total	17	Total	17

JUNIOR

First Semester		Second Semester	
School Hygiene Phys. Ed. 196	3(3-0)	Educational Administration A Educ. 105	3(3-0)
History of English Literature Engl. 181	3(3-0)	Psychology of Childhood and Adolescence Educ. 208	3(3-0)
General Microbiology Bact. 101	3(1-6)	Therapeutics and Massage Phys. Ed. 172	2(1-3)
Physical Diagnosis W Phys. Ed. 170	3(3-0)	American History I Hist. 201	3(3-0)
Folk Dancing I Phys. Ed. 160	1(0-3)	Folk Dancing II Phys. Ed. 161	1(0-3)
Sports Technic I Phys. Ed. 165A	1(1-0)	Sports Technic II Phys. Ed. 165B	1(1-0)
General Technic of Gymnastics V Phys. Ed. 156E	1(0-3)	General Technic of Gymnastics VI Phys. Ed. 156F	1(0-3)
		Methods of Teaching Gymnastics Phys. Ed. 168	1(1-0)
Elective†	2(-)	Elective†	2(-)
Total	17	Total	17

SENIOR

First Semester		Second Semester	
Educational Psychology Educ. 109	3(3-0)	Educational Sociology A Educ. 118	3(3-0)
Supervised Teaching Educ.	3(3-0)	Organization and Administration of Physical Education W Phys. Ed. 176	2(2-0)
Teaching and Adaptation of Physical Education Phys. Ed. 188	3(3-0)	Physiology of Exercise Phys. Ed. 174	2(1-3)
Sports Technic III Phys. Ed. 165C	1(1-0)	Theory and Technic of Dancing Phys. Ed. 163	1(1-0)
General Technic of Gymnastics VII Phys. Ed. 156G	1(0-3)	General Technic of Gymnastics VIII Phys. Ed. 156H	1(0-3)
Elective†	6(-)	Elective†	7(-)
Total	17	Total	16

Summary.—Physical education, 43 hours; professional education, 18 hours; other prescribed subjects, 58 hours; general electives, 17 hours. Total, 132 semester hours.

† All electives are to be chosen in accordance with the general rules governing electives, and taken in departments other than that of physical education.

Adaptation in Effect September, 1927

FOR CLASS OF 1929

Junior and senior years will be the same as for the class of 1931, excepting that as General Microbiology was taken in the sophomore year, Kinesiology will be taken the first semester of the junior year, and that School Hygiene will replace three hours of electives in the senior year, first semester.

FOR CLASS OF 1930

Sophomore, junior and senior years will be the same as for the class of 1931, excepting that Library Methods, 1(1-0), will replace one hour of elective, first semester, sophomore year.

Curriculum in Rural Commerce

In effect September, 1927, for classes of 1931 and later years.

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Physical or Biological Science§	5(-) *or* 3(-)	Physical or Biological Science§	3(-) *or* 5(-)
Modern Language§	3(3-0)	Modern Language§	3(3-0)
Plant Trigonometry§ Math. 101	3(3-0)	College Algebra§ Math. 104	3(3-0)
Extempore Speech I Pub. Spkg. 106	2(2-0)	Extempore Speech II Pub. Spkg. 108	2(2-0)
Current History Hist. 126	1(1-0)	Current History Hist. 126	1(1-0)
Library Methods Lib. Econ. 101	1(1-0)		
Infantry I (Men) Mil. Tr. 101	1½(0-4)	Infantry II (Men) Mil. Tr. 102	1½(0-4)
Physical Education M (Men) Phys. Ed. 103	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 104	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 151A	R(0-3)	Physical Education W (Women) Phys. Ed. 152A	R(0-3)
Total	16 or 17½	Total	17 or 18½

SOPHOMORE

In effect for classes of 1930 and later years.

First Semester		Second Semester	
Commercial Correspondence Engl. 122	3(3-0)	Written and Oral Salesmanship Engl. 123	3(3-0)
Modern Language	3(3-0)	Economics Econ. 101	3(3-0)*or*
Am. Industrial History Hist. 105	3(3-0)*or*	Agricultural Economics Ag. Econ. 101	3(3-0)
Am. Agricultural History Hist. 204	3(3-0)*or*	Business Management Econ. 126	2(2-0)
History of Commerce and Industry Hist. 110	3(3-0)	Business Law A Hist. 161	2(2-0)
Economic Geography Econ. 121A	2(2-0)		
Accounting Practice I§ Math. 140A	3(2-3)	Accounting Practice II Math. 143A	3(2-3)
Psychology A Educ. 101	3(3-0)	Applied Psychology Educ. 170	3(3-0)
Infantry III (Men) Mil. Tr. 103	1½(0-4)	Infantry IV (Men) Mil. Tr. 104	1½(0-4)
Physical Education M (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W (Women) Phys. Ed. 153	R(0-3)	Physical Education W (Women) Phys. Ed. 154	R(0-3)
Total	17 or 18½	Total	16 or 17½

§ (See footnote next page.)

JUNIOR

First Semester		Second Semester	
Principles of Advertising Ind. Jour. 179	3(3-0)	Mathematics of Investment Math. 150	3(3-0)
English Literature Engl. 172	3(3-0)	Money and Banking Econ. 116	3(3-0)
Cost Accounting Econ. 131	2(2-0)*or*	Public Finance Econ. 213	2(2-0)
Farm Cost Accounting Ag. Econ. 112	3(2-3)	Labor Problems Econ. 233	2(2-0)
Sociology Econ. 151	3(3-0)	American Government Hist. 151, 152 *or* 153	3(3-0)
Electives†	5 or 4(-)	Electives†	3(-)
Total	16	Total	16

SENIOR

First Semester		Second Semester	
Latin America Hist. 207	2(2-0)	Transportation Problems Econ. 229	2(2-0)
Elective†	14(-)	Elective†	14(-)
Total	16	Total	16

Summary.—Men: Physical education, required; military science, 6 hours; commercial courses, 38 or 39 hours; other prescribed courses, 56 hours; elective, 36 or 35 hours. Total, 136 semester hours. Women: The same, except no military science. Total, 130 semester hours.

Six-year Curriculum in General Science and Veterinary Medicine

FRESHMAN

First Semester		Second Semester	
Anatomy I Anat. 103	3(2-3)	Anatomy II Anat. 108	8(4-12)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
College Algebra* Math. 104	3(3-0)		
Military Science I (Vet.) Mil. Tr. 121	1½(0-4)	Military Science II (Vet.) Mil. Tr. 122	1½(0-4)
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	15½ or 17½*	Total	17½

* Students who offer but one unit of algebra for admission take a five-year credit course in College Algebra, Math. 107, making a total of 17½ credits for the semester.

† Electives are to be chosen, with the advice and approval of the dean, in groups of not less than eight semester credits, or in courses which extend fields already entered in the required work.

§ Eight hours of physical or biological science are to be elected in this curriculum, if possible in the freshman year. Subject to any prerequisites, chemistry, physics, botany, zoology and geology are available. If Chemistry I is taken, Chemistry II is required also. In one modern language a student must attain the proficiency given by nine semester hours of College work. If the language has been studied in high school, elementary work may be avoided in College, and the time saved used for elective studies. Students who have had only one year of high-school algebra are not assigned to trigonometry, but are assigned to a five-credit course in College Algebra, Math. 107, the first semester, postponing trigonometry, current history and library methods to the second semester. Accounting practice requires the previous study of elementary bookkeeping. Students who have not had a course in bookkeeping will be assigned to Accounting, Math. 137A, for which they will be allowed credit on electives. Because of the various contingencies and elective possibilities in the sciences and modern languages, the proper planning of the work of the freshman year requires great care and foresight.

SOPHOMORE

First Semester		Second Semester	
Histology I		Histology II	
Path. 102	2(1-3)	Path. 107	4(1-9)
German I *or* French I		German II *or* French II	
Mod. Lang. 101 *or* 151	3(3-0)	Mod. Lang. 102 *or* 152	3(3-0)
General Zoölogy		Plane Trigonometry	
Zoöl. 105	5(3-6)	Math. 101	3(3-0)
Library Methods		Principles of Feeding	
Lib. Econ. 101	1(1-0)	An. Husb. 152	3(3-0)
Organic Chemistry I		Organic Chemistry II	
Chem. 218	4(2-6)	Chem. 219	4(2-6)
Military Science III (Vet.)		Military Science IV (Vet.)	
Mil. Tr. 123	1½(0-4)	Mil. Tr. 124	1½(0-4)
Physical Education M		Physical Education M	
Phys. Ed. 105	R(0-2)	Phys. Ed. 106	R(0-2)
Total	16½	Total	18½

JUNIOR

First Semester		Second Semester	
Anatomy III		Anatomy IV	
Anat. 112	4(1-9)	Anat. 116	3(1-6)
General Botany I		General Botany II	
Bot. 101	3(1-4, 2)	Bot. 105	3(1-4, 2)
General Physics I		General Physics II	
Physics 135	4(3-3)	Physics 140	4(3-3)
Live-stock Judging		Pathogenic Bacteriology I	
An. Husb. 120	3(2-4)	Bact. 111	4(2-6)
Modern Europe II		American Industrial History	
Hist. 223	3(3-0)	Hist. 105	3(3-0)
		Dairy Judging	
		Dairy Husb. 104	1(0-3)
Total	17	Total	18

SENIOR

First Semester		Second Semester	
Comparative Physiology I		Comparative Physiology II	
Anat. 221	5(4-3)	Anat. 226	3(2-3)
Pathogenic Bacteriology II		Dairy Bacteriology	
Bact. 116	4(2-6)	Bact. 211	3(1-6)
Parasitology		Embryology A	
Zoöl. 208	3(2-3)	Zoöl. 135	3(2-3)
		Dairy Inspection II	
		Dairy Husb. 118	1(0-3)
Elements of Statistics		American Government	
Math. 126	3(3-0)	Hist. 151	3(3-0)
Advanced German or French		Pathology I	
Mod. Lang.	4(4-0) *or* 3(3-0)	Path. 202	3(2-3)
Total	19 *or* 18	Total	16

Summary for the first four years.—Physical education, required; military science, 6 hours; sciences, 54 hours; veterinary subjects, 35 hours; other prescribed subjects, 42 to 45 hours. Total 137 to 140 semester hours.

FIFTH YEAR

The same as the junior year in the curriculum in veterinary medicine, except that four semester hours of elective replace Pathogenic Bacteriology II, which has been taken in the junior year.

SIXTH YEAR

The same as the senior year in the curriculum in veterinary medicine, except that four hours of elective replace Parasitology, 3 hours, and Dairy Inspection II, 1 hour, these having been taken in the senior year.

Summary.—Physical education, required; military science, 6 hours; sciences, 56 hours; veterinary subjects, 99 hours; other prescribed subjects, 47 to 50 hours; elective, 7 hours. Total, 215-218 semester hours.

Groups of Electives and Options for Students in the Division of General Science

In addition to the courses included in the following groups, others will be found described in the exposition of the work of the respective departments. From any group elected a sufficient number of courses to constitute an effective block of knowledge must be taken. At least eight semester credits in any new field are usually required, but a smaller number will be honored if in a field already entered upon. In a modern language a student must reach a point equivalent to that obtained by college courses aggregating eight or nine semester hours.

Any student desiring to major in a certain field should confer with the head of the department in which the work is given. This conference should be held in the sophomore year, or earlier, so that a decision may be made in respect to the subjects that should be taken and their proper sequence. These will vary with the objective of the student which may be general culture, or preparation for teaching, research, or some other profession.

1. English Language

First Semester		Second Semester	
Advanced Composition I Engl. 113	2(2-0)	Advanced Composition II Engl. 116	2(2-0)
Commercial Correspondence Engl. 122	3(3-0)	Written and Oral Salesmanship Engl. 123	3(3-0)
Oral English Engl. 128	3(3-0)	Methods of Teaching English Engl. 134	3(3-0)
The Short Story I Engl. 251	3(3-0)	The Short Story II Engl. 252	3(3-0)
The Light Essay Engl. 225	2(2-0)	Critical Writing Engl. 202	3(3-0)
		Technical Writing Engl. 207	2(2-0)

2. English Literature

First Semester		Second Semester	
Chaucer Engl. 260	3(3-0)	Milton and the Puritan Revolt Engl. 262	3(3-0)
The English Bible Engl. 271	3(3-0)	American Survey Engl. 265	2(2-0)
Shakespearean Drama I Engl. 273	3(3-0)	Shakespearean Drama II Engl. 274	3(3-0)
The English Romantic Revival Engl. 278	3(3-0)	English Essayists of the Eighteenth and Nineteenth Centuries Engl. 276	3(3-0)
World Classics I Engl. 280	3(3-0)	World Classics II Engl. 281	3(3-0)
Contemporary Fiction Engl. 283	3(3-0)	Contemporary Drama Engl. 284	3(3-0)
The Novel I Engl. 286	3(3-0)	The Novel II Engl. 287	3(3-0)
English Survey I Engl. 288	2(2-0)	English Survey II Engl. 290	2(2-0)
American Literature Engl. 175	3(3-0)	Browning and Tennyson Engl. 293	3(3-0)
		Contemporary Poetry Engl. 297	3(3-0)

3. German

First Semester		Second Semester	
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
German Readings Mod. Lang. 111	3(3-0)	German Short Stories Mod. Lang. 201	3(3-0)
Scientific German I Mod. Lang. 237	4(4-0)	German Classics Mod. Lang. 226	3(3-0)

4. French and Spanish

First Semester		Second Semester	
French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 152	3(3-0)
French Readings Mod. Lang. 161	3(3-0)	French Short Stories Mod. Lang. 251	3(3-0)
French Composition and Conversation Mod. Lang. 261	3(3-0)	French Drama Mod. Lang. 256	3(3-0)
Spanish I Mod. Lang. 176	3(3-0)	Spanish II Mod. Lang. 177	3(3-0)
Spanish Readings Mod. Lang. 180	3(3-0)	Spanish Short Stories Mod. Lang. 272	3(3-0)
The Spanish Novel Mod. Lang. 275	3(3-0)	The Spanish Drama Mod. Lang. 280	3(3-0)
Spanish Conversation Mod. Lang. 195A	3(3-0)	Spanish Conversation Mod. Lang. 195A	3(3-0)

5. Mathematics

First Semester		Second Semester	
Plane Analytical Geometry Math. 110	4(4-0)	Calculus Math. 119	3(3-0)
Calculus I Math. 205	5(5-0)	Calculus II Math. 206	3(3-0)
Elements of Statistics Math. 126	3(3-0)	Institutional Accounting Math. 131	3(3-0)
Differential Equations Math. 201	3(3-0)	Special Methods in the Teaching of Mathematics Math. 122	3(3-0)
		Advanced Accounting I Math. 156	3(3-0)
		Advanced Accounting II Math. 160	3(3-0)

6. Inorganic Chemistry

First Semester		Second Semester	
Advanced Inorganic Chemistry Chem. 207	3(3-0)	Industrial Electrochemistry Chem. 205	2(2-0)
Inorganic Preparations Chem. 202	2(0-6) to 4(0-12)	Physical Chemistry Chem. 206	5(3-6)
Industrial Chemistry I Chem. 203	5(3-6)	Industrial Chemistry II Chem. 204	5(3-6)

7. Organic Chemistry

First Semester		Second Semester	
Organic Chemistry I Chem. 218	4(2-6)	Organic Chemistry II Chem. 219	4(2-6)
Elementary Organic Chemistry Chem. 123	3(2-3)	Stereoisomeric and Tautomeric Compounds Chem. 225	2(2-0)
Organic Preparations Chem. 223	5(0-15)	Carbocyclic and Heterocyclic Compounds Chem. 226	2(2-0)
Qualitative Org. Analysis Chem. 224	2(0-6)	Physiological Chemistry Chem. 231	5(3-6)
Physiological Chemistry I Chem. 232	5(3-6)	Physiological Chemistry II Chem. 233	5(3-6)
Pathological Chemistry Chem. 235	2(2-0)		
Organic Chemistry (HE) Chem. 121	5(3-6)		

8. Analytical Chemistry

First Semester		Second Semester	
Quantitative Analysis A Chem. 250	3(1-6)	Quantitative Analysis B Chem. 251	3(1-6)
Advanced Qualitative Analysis Chem. 240	3(1-6)		

9. Physics

FIRST SEMESTER

Household Physics
Phys. 101 ..... 4(3-3)

Photography
Physics 120 ..... 2(1-3)

Molecular Physics and Heat
Physics 220 ..... 3(2-3)

Wireless Telephony
Physics 130 ..... 2(1-3)

Spectroscopy
Physics 230 ..... 3(1-6)

Radio Measurements
Physics 245 ..... 2(1-3)

Advanced Electrical Laboratory
Physics 256 ..... 1(0-3) *or* 2(0-6)

Advanced Light Laboratory
Physics 258 ..... 1(0-3) *or* 2(0-6)

SECOND SEMESTER

Harmonics
Physics 222 ..... 2(2-0)

Special Methods in the Teaching of Physics
Physics 224 ..... 3(2-3)

Meteorology
Physics 133 ..... 2(2-0)

Descriptive Astronomy
Physics 155 ..... 3(3-0)

Storage Batteries
Physics 235 ..... 2(1-3)

Radioactivity and Electron Theory
Physics 233 ..... 3(3-0)

Advanced Mechanics Laboratory
Physics 252 ..... 1(0-3) *or* 2(0-6)

Advanced Heat Laboratory
Physics 254 ..... 1(0-3) *or* 2(0-6)

Biophysics
Physics 264 ..... 3(2-3)

10. Microbiology

FIRST SEMESTER

Agricultural Microbiology
Bact. 106 ..... 3(1-6)

Hygienic Bacteriology
Bact. 206 ..... 4(2-6)

Pathogenic Bacteriology II
Bact. 116 ..... 4(2-6)

Poultry Bacteriology
Bact. 216 ..... 3(1-6)

SECOND SEMESTER

Soil Microbiology
Bact 202 ..... 3(3-0)

Pathogenic Bacteriology I
Bact. 111 ..... 4(2-6)

Dairy Bacteriology
Bact. 211 ..... 3(1-6)

11. Botany

FIRST SEMESTER

General Botany I
Bot. 101 ..... 3(1-4, 2)

Plant Pathology I
Bot. 205 ..... 3(1-4, 2)

Mycology I
Bot. 204 ..... 4(2-4, 2)

Plant Physiology I
Bot. 208 ..... 3(3-0)

Fruit Crop Diseases
Bot. 202 ..... 2(1-2, 1)

Botanical Problems
Bot. 232 ..... 1 to 5(-)

Taxonomic Botany of the Flowering Plants
Bot. 225 ..... 3(1-4, 2)

SECOND SEMESTER

General Botany II
Bot. 105 ..... 3(1-4, 2)

Plant Histology
Bot. 215 ..... 2(0-6)

Plant Physiology II
Bot. 209 ..... 2(0-4, 2)

Plant Ecology
Bot. 228 ..... 2(2-0)

Field Crop Diseases
Bot. 240 ..... 2(1-2, 1)

Vegetable Diseases
Bot. 245 ..... 2(1-2, 1)

12. Zoölogy

FIRST SEMESTER

Advanced Human Physiology
Zoöl. 235 ..... 4(3-3)

Cytology
Zoöl. 214 ..... 4(2-6)

Parasitology
Zoöl. 208 ..... 3(2-3)

Taxonomy of Parasites
Zoöl. 240 ..... 2(1-3)

Field Zoölogy
Zoöl. 205 ..... 3(1-6)

Heredity and Eugenics
Zoöl. 216 ..... 2(2-0)

Zoölogical Problems
Zoöl. 203 ..... 1 *or* 2(-)

Zoölogical Technic
Zoöl. 206 ..... 1 *or* 2(-)

SECOND SEMESTER

Comparative Anatomy of Vertebrates
Zoöl. 245 ..... 3(1-6)

Animal Ecology
Zoöl. 211 ..... 3(1-6)

Ornithology
Zoöl. 230A ..... 3(2-3)

Embryology A
Zoöl. 135 ..... 3(2-3)

Advanced Embryology
Zoöl. 220 ..... 4(2-6)

Human Parasitology
Zoöl. 218 ..... 3(3-0)

Zoölogical Problems
Zoöl. 203 ..... 1 *or* 2(-)

Zoölogical Technic
Zoöl. 206 ..... 1 *or* 2(-)

13. Geology

First Semester

Engineering Geology
Geol. 102 ..... 4(3-3)

Economic Geology
Geol. 207 ..... 4(3-3)

Crystallography and Mineralogy
Geol. 209 ..... 4(2-6)

Second Semester

Historical Geology
Geol. 203 ..... 4(3-3)

General Geology
Geol. 103 ..... 3(3-0)

14. Entomology

First Semester

General Entomology
Ent. 203 ..... 3(2-3)

Insect Morphology I
Ent. 211 ..... 3(1-6)

Advanced General Entomology
Ent. 221 ..... 3(3-0)

Advanced Apiculture B
Ent. 228 ..... 3(2-3)

Second Semester

General Economic Entomology
Ent. 206 ..... 3(2-3)

Apiculture
Ent. 111 ..... 3(2-3)

Principles of Taxonomy
Ent. 216 ..... 1(1-0)

Taxonomy of Insects I
Ent. 217 ..... 2(0-6)

Insect Physiology
Ent. 234 ..... 2(2-0)

15. History and Government

First Semester

American History II
Hist. 202 ..... 3(3-0)

American Industrial History
Hist. 105 ..... 3(3-0)

History of Commerce and Industry
Hist. 110 ..... 3(3-0)

Latin America
Hist. 207 ..... 2(2-0)

The British Empire
Hist. 226 ..... 2(2-0)

American Political History
Hist. 206 ..... 2(2-0)

American National Government
Hist. 152 ..... 3(3-0)

Twentieth Century Europe
Hist. 224 ..... 2(2-0)

Second Semester

American History III
Hist. 203 ..... 3(3-0)

Modern Europe I
Hist. 115 ..... 3(3-0)

Modern Europe II
Hist. 223 ..... 3(3-0)

Immigration and International Relations
Hist. 228 ..... 2(2-0)

Comparative Government
Hist. 252 ..... 2(2-0)

American State Government
Hist. 153 ..... 3(3-10)

History of the Far East
Hist. 229 ..... 2(2-0)

Government Regulations of Business
Hist. 260 ..... 2(2-0)

16. Law

First Semester

Business Law A
Hist. 161 ..... 2(2-0)

Commercial Law
Hist. 160 ..... 1(1-0)

Second Semester

Business Law B
Hist. 162 ..... 2(2-0)

Farm Law
Hist. 175 ..... 2(2-0)

17. Economics and Sociology

First Semester

Economics
Econ. 101 ..... 3(3-0)

Rural Sociology
Econ. 156 ..... 3(3-0)

Money and Banking
Econ. 116 ..... 3(3-0)

Labor Problems
Econ. 233 ..... 2(2-0)

Marketing Practice
Econ. 245 ..... 2(2-0)

Business Finance
Econ. 217 ..... 3(3-0)

Advanced Principles of Economics
Econ. 251 ..... 3(3-0)

Second Semester

Economic Geography
Econ. 122 ..... 2(2-0)

Sociology
Econ. 151 ..... 3(3-0)

Business Management
Econ. 126 ..... 2(2-0)

Public Finance
Econ. 213 ..... 2(2-0)

Life Insurance
Econ. 244 ..... 2(2-0)

Property Insurance
Econ. 242 ..... 2(2-0)

Investments
Econ. 221 ..... 2(2-0)

18. Education

First Semester		Second Semester	
Educational Administration A *or* B Educ. 105 *or* 106	3(3-0)	Methods of Teaching A Educ. 111	3(3-0)
History of Education A Educ. 113	3(3-0)	Educational Psychology A Educ. 118	3(3-0)
Supervised Teaching and Observation in Science Educ. 163	3(1-6)	Statistical Methods Applied to Education Educ. 223	3(3-0)
Rural Life and Education Educ. 201	3(3-0)	The Psychology of Childhood and Adolescence Educ. 208	3(3-0)
Psychology A, B. *or* C Educ. 101-103	3(3-0)	Educational Psychology Educ. 109	3(3-0)
Mental Measurements Educ. 211	3(3-0)	Abnormal Psychology Educ. 213	3(3-0)
Educational Measurements Educ. 212	3(3-0)	Advanced Psychology Educ. 216	3(3-0)
Applied Psychology Educ. 170	3(3-0)	The Technic of Mental Testing Educ. 235	3(1-6)
History of Philosophy Educ. 150	3(3-0)	Rural Secondary Education Educ. 204	3(3-0)
		Philosophy of Education Educ. 206	3(3-0)

19. Vocational Education

First Semester		Second Semester	
Vocational Education A Educ. 125	3(3-0)	Special Methods in the Teaching of Agriculture Educ. 136	3(3-0)
Vocational Education B Educ. 226	3(3-0)	Supervised Observation and Teaching in Agriculture Educ. 161	3(0-9)
		Special Methods in the Teaching of Home Economics Educ. 132	3(3-0)
		Supervised Teaching in Home Economics Educ. 160	3(0-9)
Agricultural Education B Educ. 330	3(3-0)	Special Methods in the Teaching of Industrial Arts Subjects Educ. 140	3(3-0)

20. Industrial Journalism

First Semester		Second Semester	
Elementary Journalism Ind. Jour. 151	2(2-0)	Industrial Writing Ind. Jour. 161	2(2-0)
Journalism Practice I Ind. Jour. 154	2(0-6)	Journalism Practice II Ind. Jour. 155	2(0-6)
Industrial Feature Writing I Ind. Jour. 167	2(2-0)	Industrial Feature Writing II Ind. Jour. 171	2(2-0)
Journalism Practice III Ind. Jour. 158	2(0-6)	Journalism Practice IV Ind. Jour. 159	2(0-6)
Materials of Journalism Ind. Jour. 265	2(2-0)	Magazine Features Ind. Jour. 270	2(2-0)
History of Journalism Ind. Jour. 274	2(2-0)	Journalism Surveys Ind. Jour. 278	2(0-6)

23. Music

The acceptability for elective credit of work in voice or instrumental music is contingent upon the attainment of an effective degree of proficiency.

Voice A (Music 161A to 161H)
Two private lessons a week. Two credits per semester.

Piano A (Music 172A to 172H)
Two private lessons a week. Two credits per semester.

Violin A (Music 166)
Two private lessons a week. Two credits per semester.

Wind Instruments (Music 182)
Two private lessons a week. Two credits per semester.

First Semester	Second Semester
Harmony I Music 101 ..... 2(2-0)	Harmony II Music 102 ..... 2(2-0)
Harmony III Music 103 ..... 2(2-0)	Harmony IV Music 104 ..... 2(2-0)
Counterpoint Music 108A ..... 2(2-0)	Musical Form and Analysis Music 109 ..... 2(2-0)
History and Appreciation of Music I Music 112 ..... 3(3-0)	History and Appreciation of Music II Music 113 ..... 3(3-0)
Public School Music I Music 120 ..... 2(2-0)	Public School Music II Music 121 ..... 2(2-0)
Public School Music III Music 122 ..... 2(2-0)	Public School Music IV Music 123 ..... 2(2-0)
Orchestra Music 193A to 193H..... 1(1-0)	Orchestra Music 193A to 193H..... 1(1-0)
Band Music 196A to 196H..... 1(1-0)	Band Music 196A to 196H..... 1(1-0)

24. Rural Leadership

(a) For all; (b) for those preparing for work in agricultural extension; (c) for adult special students; (d) for those preparing for home economics extension.

First Semester	Second Semester
(a) Rural Sociology Econ. 156 ..... 3(3-0)	(a) Community Organization Econ. 267 ..... 3(3-0)
(a) Agricultural Economics Ag. Econ. 101 ..... 3(3-0)	(b, c) Marketing of Farm Products Ag. Ec. 202 ..... 3(3-0)
(a) Rural Life and Education Educ. 201 ..... 3(3-0)	(c) Parliamentary Procedure Pub. Spk. 125 ..... 2(2-0)
(c, d) Social Problems Econ. 257 ..... 2(2-0)	(c, d) Sanitation and Public Health Child Welf. 211 ..... 3(3-0)
(d) Child Welfare I Child Welf. 201..... 3(1-6)	(d) Home Nursing Child Welf. 106 ..... 1(1-0)

25. Military Science and Tactics

First Semester	Second Semester
Infantry V Mil. Tr. 109 ..... 3(2-3)	Infantry VI Mil. Tr. 110 ..... 3(2-3)
Infantry VII Mil. Tr. 111 ..... 3(2-3)	Infantry VIII Mil. Tr. 112 ..... 3(2-3)

26. Physical Education and Athletics

First Semester	Second Semester
Personal Hygiene Phys. Ed. 119 ..... 2(2-0)	Wrestling Phys. Ed. 128 ..... 1(0-3)
Basket Ball Phys. Ed. 130A ..... 2(1-3)	Football I Phys. Ed. 126A ..... 2(1-3)
Track and Field Sports Phys. Ed. 140A ..... 2(1-3)	Baseball Phys. Ed. 135A ..... 2(1-3)

27. Public Speaking

First Semester		Second Semester	
Oral Interpretation Pub. Spkg. 101	2(2-0)	Dramatic Reading Pub. Spkg. 102	2(2-0)
Parliamentary Procedure Pub. Spkg. 125	2(2-0)	Lecture Recital Pub. Spkg. 115	2(2-0)
Dramatic Production I Pub. Spkg. 130	2(2-0)	Dramatic Production II Pub. Spkg. 135	2(2-0)
Argumentation and Debate I Pub. Spkg. 121	2(2-0)	Argumentation and Debate II Pub. Spkg. 122	2(2-0)
Pageant Composition Pub. Spkg. 140	3(3-0)	Pageant Production Pub. Spkg. 145	3(3-0)

30. Social Science

(Political and Social History, Government, Economics, and Sociology.)

First Semester		Second Semester	
American History I Hist. 201	3(3-0)	American History II *or* III Hist. 202 *or* 203	3(3-0)
American Government Hist. 151	3(3-0)*or*	American State Government Hist. 153	3(3-0)
American National Government Hist. 152	3(3-0)	Modern Europe I Hist. 115	3(3-0)
Latin America Hist. 207	2(2-0)		
English History Hist. 121	3(3-0)	Modern Europe II Hist. 223	3(3-0)
Economics Econ. 101	3(3-0)	Agricultural Economics Ag. Ec. 101	3(3-0)
		Money and Banking Econ. 116	3(3-0)
Labor Problems Econ. 233	2(2-0)	Public Finance Econ. 213	2(2-0)
Sociology Econ. 151	3(3-0)	Marketing of Farm Products Ag. Ec. 202	3(3-0)
		Agricultural Land Problems Ag. Ec. 218	3(3-0)

31. Applied Science

First Semester		Second Semester	
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Plant Pathology I Bot. 205	3(1-4, 2)	Field Crop Diseases Bot. 240	2(1-2, 1)
Fruit Crop Diseases Bot. 202	2(1-2, 1)	Vegetable Diseases Bot. 245	2(1-2, 1)
Farm Forestry Hort. 114	3(2-3)	Seed Identification and Weed Control Agron. 105	2(1-3)
General Zoölogy Zoöl. 105	5(3-6)	Elements of Horticulture Hort. 107	3(2-3)
Parasitology Zoöl. 208	3(2-3)	Small Fruits Hort. 110	2(2-0)
Zoölogy and Embryology (Vet.) Zoöl. 109	5(3-6)	Gardening Hort. 122	3(3-0)
Hygienic Bacteriology Bact. 206	4(2-6)	Landscape Gardening I Hort. 125	3(3-0)
General Entomology Ent. 203	3(2-3)	General Microbiology Bact. 101	3(1-6)
Horticultural Entomology Ent. 201	2(2-0)	General Economic Entomology Ent. 206	3(2-3)
Elementary Organic Chemistry Chem. 123	3(2-3)	Apiculture Ent. 111	3(2-3)
Chemistry of Soils and Fertilizers Chem. 252A	2(0-6)	Chemistry of Crops Chem. 253A	2(0-6)
Economic Geology Geol. 207	4(3-3)	Dairy Chemistry Chem. 254	3(1-6)
Human Nutrition Food and Nut. 112	3(3-0)	Historical Geology Geol. 203	4(3-3)
Household Physics Physics 101	4(3-3)		
Photography Physics 120	2(1-3)	Meteorology Physics 133	2(2-0)

32. Home Economics

First Semester		Second Semester	
Household Physics Physics 101	4(3-3)	Foods I Food and Nut. 101	3(1-6)
Organic Chemistry (HE) Chem. 121	5(3-6)	Household Microbiology Bact. 121A	3(1-6)
Foods II Food and Nut. 106	5(3-6)	Dietetics Food and Nut. 201	5(3-6)
Human Nutrition Food and Nut. 112	3(3-0)	Clothing I Clo. and Text. 101	2(1-3)
Clothing II Clo. and Text. 111	3(1-6)	Costume Design I Ap. Art 130	2(0-6)
Applied Design I Ap. Art. 101	3(1-6)	Textiles Clo. and Text. 116	3(2-3)
Applied Design II Ap. Art. 102	3(1-6)	House Furnishings Ap. Art 108	2(1-3)
Interior Decoration and Furnishing Ap. Art. 114	3(1-6)	Principles of Art and Their Appreciation I Ap. Art 124	3(3-0)

35. Agriculture

First Semester		Second Semester	
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Live-stock Judging An. Husb. 120	3(2-4)		
Elements of Dairying Dairy Husb. 101	3(2-3)	Dairy Judging Dairy Husb. 104	1(0-3)
Elementary Organic Chemistry Chem. 123	3(2-3)		
Plant Pathology I Bot. 205	3(1-4, 2)	Principles of Feeding An. Husb. 152	3(3-0)
Soils Agron. 130	4(3-3)	Farm Crops Agron. 101	4(2-6)
Farm Poultry Production Poultry Husb. 101	2(1-2, 1)	Elements of Horticulture Hort. 107	3(2-3)

36. Architecture

First Semester		Second Semester	
Engineering Drawing Mach. Design 101	2(0-6)	Descriptive Geometry Mach. Design 106	2(0-6)
Elements of Architecture I Arch. 106A	3(0-9)	Elements of Architecture II Arch. 107A	3(0-9)
Object Drawing I Arch. 111	2(0-6)	Object Drawing II Arch. 114	2(0-6)
Design I Arch. 142	3(0-9)	Design II Arch. 144	3(0-9)
Commercial Illustration I Arch. 165	2(0-6)	Commercial Illustration II Arch. 170	2(0-6)
		Domestic Architecture Arch. 124	2(2-0)

37. Manual Training

First Semester		Second Semester	
Engineering Drawing Mach. Design 101	2(0-6)	Engineering Woodwork I Shop 101	1(0-3)
Descriptive Geometry Mach. Design 106	2(0-6)	Manual Training for Primary Grades Shop 117	2(0-6)
Woodworking for Grammar Grades Shop 120	2(0-6)	Woodworking I for High Schools Shop 125	2(0-6)
Woodworking II for High Schools Shop 130	2(0-6)	Wood Turning Shop 135	2(0-6)
Forging I Shop 150	1(0-3)		
Machine Tool Work I Shop 170	2(0-6)	Machine Tool Work II Shop 192	2(0-6)
Machine Tool Work III Shop 193	1(0-3)	Metallurgy Shop 165	2(2-0)
Farm Motors Ag. Engr. 125, 126	3(2-3)	Farm Buildings Ag. Engr. 103	3(1-6)
Machine Drawing I Mach. Design 111	2(0-6)	Surveying I Civ. Engr. 102	2(0-6)

45. Milling Industry

First Semester		Second Semester	
Principles of Milling I Mill. Ind 104	2(1-3)	Principles of Milling II Mill. Ind. 106	1(0-3)
Milling Practice I Mill. Ind. 109	3(1-6)	Milling Practice II Mill. Ind. 111	3(1-6)
Wheat and Flour Testing Mill. Ind. 205	3(0-9)	Advanced Wheat and Flour Testing Mill. Ind. 210	1 to 5(-)
Farm Crops Agron. 101	4(2-6)	Milling Qualities of Wheat Mill. Ind. 212	3(3-0)
Grain Marketing Ag. Ec. 203	3(3-0)	Experimental Baking Mill. Ind. 206	3(1-6)
Grain Grading and Judging Agron. 108	2(0-6)		
Quantitative Analysis A Chem. 250	3(1-6)	Quantitative Analysis B Chem. 251	3(1-6)
Elementary Organic Chemistry Chem. 123	3(2-3)	The Chemistry of Proteins Chem. 236A	3(2-3)

Bacteriology

Professor Bushnell
Professor Gainey
Associate Professor Fay
Assistant Professor Brandly
Instructor Sarles
Graduate Assistant Foltz

The Department of Bacteriology occupies parts of the first and second floors of Veterinary Hall. The space is divided into offices and private laboratories, an experiment station and research laboratory, two large general laboratories, incubator or temperature room, preparation room, and stock room. The laboratories are well lighted and equipped with gas, lockers, ice chests, sterilizers, wall cases, microscopes, and other modern facilities necessary for bacteriological work.

The instruction consists of lectures, recitations, demonstrations, and laboratory practice. Printed synopses of lectures and printed laboratory directions are furnished the students in some of the courses; in others textbooks are required. The department library contains textbooks on bacteriology and allied subjects, also the current files of the important technical periodicals relating to bacteriology. These are at the constant disposal of the students for reference. To those who desire graduate work the department offers excellent facilities.

Bacteriology is presented to the students as a biological science and as a practical factor in everyday life. In this subject only the simplest forms of life, consisting almost invariably of one-celled organisms, are studied. It is now possible to study these microscopical forms with ease and accuracy, thus paving the way for a more complete study and better understanding of cells in the aggregate. The second point of view from which this subject is approached is that of its practical application in agriculture, medicine, domestic science, and sanitation.

This department owns equipment valued at $15,686.

COURSES IN BACTERIOLOGY

FOR UNDERGRADUATE CREDIT

101. General Microbiology. 3(1-6); I and II.* Not open to students who have credit in Bact. 106 or 121. Prerequisite: Chemistry II. Dr. Gainey and Mr. Sarles.

* The number before the parenthesis indicates the number of semester hours of credit; the first number within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week. I, II, and SS indicate that the course is given the first semester, second semester, and summer session, respectively.

Morphological and biological characters, classification and distribution of bacteria, factors necessary for the development of bacteria, culture media, cultural features, staining values, and fundamental principles of applied bacteriology.

Laboratory.—The student prepares culture media and becomes familiar with principles of sterilization and incubation, and with general laboratory technic. Deposit, $10.

106. Agricultural Microbiology. 3(1-6); I and II. Not open to students who have credit in Bact. 101 and 121. Prerequisite: Organic Chemistry (Chem. 120). Dr. Gainey and Mr. Fay.

A general course emphasizing particularly the relation of microörganisms to agriculture.

Laboratory.—Methods of cultivating and studying bacteria, yeasts, and molds; methods for quantitative and qualitative analysis of water, milk, etc.; methods of sterilization and use of germicidal agents. Deposit, $10.

111, 116. Pathogenic Bacteriology I and II. 4(2-6) each; II and I respectively. Prerequisite: Organic Chemistry (Vet.). Dr. Bushnell and Dr. Brandly.

I: Distribution and morphological and biochemical features of microörganisms; factors necessary for the development and cultivation of bacteria; fundamental principles of bacteriology as applied to veterinary medicine. II: Morphology, powers of resistance, pathogenesia, distribution, channels of infection, and means of dissemination of pathogenic bacteria; epizoötic and epidemic diseases of unknown etiology; manufacture, standardization, preparation for the market and use of vaccines, antitoxins, and other biological products related to diagnosis, prevention, and treatment of specific infectious diseases; and various other topics.

Laboratory.—I: General laboratory technic; different pathogenic microorganisms studied morphologically, culturally, and biochemically; quantitative and qualitative examinations of milk, and of water. II: Microscopical and cultural characteristics of pathogenic microörganisms continued; laboratory animal inoculations, autopsy, and diagnosis; prevention and treatment of specific infectious diseases; experimental production of opsonins, antitoxins, agglutinins, preciptins, and cytolysins; etc. Deposit, $10.

121A. Household Microbiology. 3(1-6); I and II. Not open to students who have credit in Bact. 101 or 106. Prerequisite: Organic Chemistry HE (Chem. 121). Mr. Fay and Mr. Sarles.

Classification, distribution, and relative importance of bacteria; morphological and biochemical characters of microörganisms; factors necessary for the proper development of bacteria; fundamental principles of the science as applied to household economics.

Laboratory.—Practical applications of theories discussed in the classroom, such as bacteriological study of water, milk, and foods; determination of the potability of water; microscopical study of yeasts and molds; methods of food preservation; the germicidal action of various disinfectants, etc. Deposit, $10.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Soil Microbiology. 3(3-0); II. Prerequisite: Course 101 or 106. Dr. Gainey.

The influences of depth and character of soil, temperature, moisture, chemical action, aëration, and other factors upon the activities of soil microörganisms; the influence of such phenomena as ammonification, nitrification, denitrification, symbiotic and nonsymbiotic nitrogen fixation upon crop production. Various texts recommended as reference books.

204. Soil Microbiology Laboratory. 2(0-6); II. Prerequisite: Course 101 or 106. To accompany or follow course 202. Dr. Gainey.

The preparation of various special culture media and reagents necessary to conduct bacteriological analyses of the soil; qualitative and quantitative an-

alysis and the laboratory study of nitrification, denitrification, and nitrogen fixation; plot experiments and field work illustrating the influence of various factors upon the bacterial flora and the inoculation of soil with nitrogen-fixing bacteria. Deposit, $10.

206. Hygienic Bacteriology. 4(2-6); I. Prerequisite: Course 101, 106, or 121. Dr. Bushnell.

Pathogenic bacteria, especially those related to disease in man; channels of infection, and means of dissemination of pathogenic bacteria; epidemics, their cause and control; and other topics dealing with bacteria in connection with health. Various books recommended as textbooks.

Laboratory.—Microscopical and cultural study of pathogenic bacteria; technic involved in the diagnosis of *Bacterium tuberculosis* in sputum; culture of pathogenic anaërobic bacteria; the isolation and indentification of pathogenic bacteria; and other practical studies of theories discussed in the classroom. Deposit, $10.

211. Dairy Bacteriology. 3(1-6); II. Prerequisite: Course 101, 106, or 121. Mr. Fay.

Bacterial flora of milk, butter, and cheese; infectious diseases conveyed through dairy products; bacterial contaminations of milk by air, water, utensils, etc.; normal and abnormal fermentations in milk, their significance and control.

Laboratory.—Preparation of culture media necessary for dairy bacteriological work; bacteriological analysis of milk; microscopical and cultural characters of the types of microörganisms representing the flora of milk, butter, and cheese; and kindred practical bacteriological studies relating to dairy products. Deposit, $10.

216. Poultry Bacteriology. 3(1-6); II. Prerequisites: Course 101, course 106 or 111. Dr. Brandly.

Etiology, sources, and modes of infection of diseases of poultry; microbial content of freshly laid eggs, cold-storage eggs, and egg products; conditions tending toward increase or decrease of this microbial content.

Laboratory.—Study of microörganisms pathogenic for poultry; microbial content of eggs and egg preparations handled and produced under various conditions. Deposit, $10.

217. Poultry Diseases. 2(2-0); II. Prerequisites: Courses 111 and 116, and Therapeutics (Surg. and Med. 162). Dr. Brandly.

Anatomy of the fowl; poultry sanitation and hygiene; a complete systematic study of the infectious diseases of all classes of domestic fowl; general diseases of a noninfectious nature; external and internal parasites of domestic fowl; minor surgical operations.

226. Bacteriological Problems. 1 to 4 credits; I, II and SS. Prerequisite: Course 101, 106, 111 or 121. Dr. Bushnell, Dr. Gainey, Mr. Fay, and Dr. Brandly.

Special problems assigned, credit depending upon amount and quality of work done. Deposit by arrangement with professor in charge.

230. Bacteriology Seminar. 1(1-0); I and II. For prerequisites, consult professor in charge. Dr. Bushnell.

Papers and discussion by members of the department and the more advanced students on all phases of current research work in bacteriology, serology, and related subjects. Graduate students in this department may be assigned to this subject for credit; others interested may visit the meetings at any time.

FOR GRADUATE CREDIT

301. Research Bacteriology. Credit to be arranged; I, II and SS. Prerequisites: At least two courses in this department. Dr. Bushnell, Dr. Gainey, Mr. Fay, and Dr. Brandly.

Properly qualified advanced students admitted to this course upon approval of the department head; supervision by a faculty member of the department, and subject for investigation chosen and outlined in consultation with him; opportunity to do experiment-station and advanced research work during vacation periods under faculty supervision; individual research problems for students working toward an advanced degree; upon completion, results presented in form of a thesis which, when accepted, fulfills part of the requirements for the master's degree. Amount of deposit to be arranged with the professor in charge.

Botany and Plant Pathology

Professor Melchers*
Professor Miller
Professor Davis
Professor Haymaker
Associate Professor Gates
Associate Professor Dalbey
Assistant Professor Elmer
Instructor Horn
Assistant Newcomb
Assistant Pathologist Ficke
Pathologist Weimer†
Associate Pathologist Fellows†
Assistant Pathologist Johnston†
Graduate Assistant Belscamper
Graduate Assistant Suit

The instruction given in the Department of Botany and Plant Pathology has a threefold purpose: To give a training in botany for the general broadening of the student's knowledge; to give a training in the knowledge of plants that will serve as a foundation for the student's further college courses in agricultural subjects; and to instruct and direct those students who desire to investigate such problems in plant life as affect agriculture. Investigations may be undertaken in plant pathology, plant physiology, taxonomy, and ecology of plants.

In the general courses each student is supplied with a compound microscope and with all the other accessories of a modern well-equipped botanical laboratory. The laboratory for advanced study is provided with the general equipment for investigational work, and additional facilities are readily available for those who desire to pursue special lines of research. The department has an excellent herbarium, especially complete for Kansas, and a botanical library containing the usual standard texts and the principal botanical journals. The equipment owned by the department has a value of $42,947.

COURSES IN BOTANY

FOR UNDERGRADUATE CREDIT

101, 105. General Botany I and II. 3(1-4, 2) each; I and SS, and II and SS., respectively. Mr. Melchers, Dr. Miller, Mr. Davis, Dr. Haymaker, Dr. Gates, Miss Dalbey, Dr. Elmer, Miss Horn, Miss Newcomb.

I: The principal life functions of plants; response of plants, such as photosynthesis, digestion, respiration, transpiration, and growth; the responses of plants to environmental conditions and physical stimuli; and the anatomy of the plant. Text: Holman and Robbins, *Textbook of General Botany.*

II: The significance of bacteria, fungi, and other microörganisms in our daily life; the more important laws governing plants in relation to their environment; fundamental laws and facts of genetics and plant breeding; the theories of evolution and general phenomena of plant life. Text: As above.

Laboratory.—I: A series of typical experiments followed out in the laboratory and in the greenhouse. Charge, $3.50.

II: Study of the morphology of the typical representatives of the great groups of the plant kingdom, the ecological factors affecting plants, and their identification under both winter and summer conditions by use of an identification key. Charge, $3.50.

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* Absent on leave, year 1927-'28.

† In coöperation with the United States Department of Agriculture.

126. Medical Botany. 2(1-3); I. Prerequisite: High-school botany or its equivalent. Dr. Gates.

The principal stock-poisoning plants of the range; habitat, poisonous properties, and methods of control and elimination of native poisonous plants.

Laboratory.—A study of the native poisonous plants of the United States, but chiefly of the Western states. Charge, $2.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Fruit Crop Diseases. 2(1-2, 1); I. Prerequisite: Course 205. Not offered in 1928-'29. Dr. Haymaker.

Diseases affecting fruit crops of all kinds; methods and measures for controlling these diseases; preparation and practical application of standard sprays. Text: Hesler and Whetzel, *Manual of Fruit Diseases.*

Laboratory.—A detailed study of each disease affecting the major fruit crops; a detailed microscopic study of the organism causing the disease. Charge, $2.

204. Mycology I. 4(2-4, 2); I. Prerequisite: Course 205. Not offered in 1928-'29. Dr. Elmer.

Classification of fungi; their relationship to one another, and their morphology; special emphasis on those fungi which cause plant disease; the physiology of fungi, infection, isolation, pure culture methods, etc.

Laboratory.—A detailed study of the genera of fungi. Charge, $5.

205. Plant Pathology I (or Economic Plant Diseases). 3(1-4, 2) or 3(2-3); I and SS. Prerequisites: Courses 101 and 105. Mr. Melchers, Dr. Haymaker and Dr. Elmer.

Causes and symptoms of plant diseases, infection phenomena, control of plant diseases, breeding for resistance, and plant quarantine.

Laboratory.—Work in the recognition of all the more common plant diseases of the farm, orchard, and garden; detailed microscopic studies of diseased tissues and identification of the fungous pathogenes which cause them. Charge, $2.

208. Plant Physiology I. 3(3-0); I. Prerequisites: Courses 101 and 105, and Chemistry I and II. Dr. Miller.

A detailed study of such subjects as the root systems of plants, absorption, wilting coefficient, resistance to drought, transpiration, water requirement, photosynthesis, respiration, digestion, and growth with special stress on the phases pertaining to agriculture.

209. Plant Physiology II. 2(0-4, 2); II. Prerequisite: Course 208. Dr. Miller.

Methods used in obtaining experimental data in regard to the more common functions of plants. Charge, $5.

212. Problems in Botanical Instruction. 3(2-3); SS. Prerequisite: Ten credit hours in botany or in courses of botanical nature. Dr. Haymaker.

Advanced work in the morphology, anatomy, physiology, taxonomy, and diseases of plants; special methods of teaching technic in presenting botany to high-school and college students. This course may be used in fulfilling the educational requirements for the state teacher's certificate. Text: Holman and Robbins, *Textbook of General Botany.* Charge $2.

215. Plant Histology. 2(0-6); II. Prerequisite: Course 101 or 105. Not offered in 1928-'29. Miss Dalbey.

A thorough training in the principles and practice of microtechnical methods in botany. Text: Chamberlain, *Plant Histology.* Charge, $3.50.

218. Field Botany. 3(1¼-3¾); SS. Prerequisites: Courses 101 and 105. Dr. Haymaker.

Study and identification of the vegetation of nearby prairies, woodland, and

swamps; morphological characteristics, distribution, habits of plants and their relation to different environmental conditions; poisonous or medicinal properties of native plants; and allied subjects. Text: Gray, *New Manual of Botany*. Charge, $2.

220. Botanical Seminar. 1(1-0); I and II. For prerequisites, consult professor in charge.

Presentation of investigational work in botany, including plant pathology, plant physiology, plant ecology, taxonomy, morphology, and genetics; fundamental papers along botanical lines reviewed and a digest presented. Graduate students taking major or minor work in the Department of Botany are expected to attend these sessions and take part in the programs.

225. Taxonomic Botany of the Flowering Plants. 3(1-4, 2); I. Prerequisites: Courses 101 and 105. Dr. Gates.

Terms employed; development of the more important systems of classification; and consideration of families of plants.

Laboratory.—Study of selected flower types representing the principal orders and families of plants; identification of plants in field and in the laboratory. Charge, $2.

228. Plant Ecology. 2(2-0); II. Prerequisites: Courses 101 and 105. Dr. Gates.

The structure and dynamics of vegetation.

Laboratory.—With the opening of vegetation in the spring, field trips are taken to selected places. Charge, $2.

230. Physiological Phenomena in the Germination of Seeds. 2(1-3); I. Prerequisites: Courses 101 and 105. Not offered in 1928-'29. Mr. Davis.

The different factors in germination of seed coats by water, solutes, and gases; dormancy, agencies in so-called after-ripening, enzymes, etc. Charge, $2.

232. Botanical Problems. 1 to 5 credits; I, II, and SS. Prerequisites: Courses 101 and 105, and approval by the head of the department. Mr. Melchers, Dr. Miller, Mr. Davis, Dr. Haymaker, Dr. Gates, Miss Dalbey, Dr. Elmer, and Miss Horn.

A student wishing to pursue a special field of work not definitely represented by one of the undergraduate elective courses may do so upon consultation with the instructor. Charge, $2.

234. Phytogeography. 2(2-0); II. Prerequisites: Courses 101 and 105. Not offered in 1928-'29. Dr. Gates.

The distribution and characteristics of vegetation.

240. Field-crop Diseases. 2(1-2, 1); II. Prerequisite: Course 205. Mr. Melchers.

The historical development of phytopathology; the various factors entering into the problem of disease resistance in plants; breeding for resistance; the most important literature on the subject.

Laboratory.—A detailed microscopic and symptom study of the fungous, bacterial, and nonparasitic plant diseases attacking cereal and forage crops other than those considered in Plant Pathology I. Charge, $2.

245. Vegetable Diseases. 2(1-2, 1); II. Prerequisite: Course 205. Not offered in 1928-'29. Mr. Melchers.

The problem of disease resistance in plants; breeding for disease resistance in vegetables.

Laboratory.—A detailed microscopic and symptom study of the fungous, bacterial, nonparasitic, and degenerative diseases attacking vegetables. Charge, $2.

265. Literature of Botany. 1(1-0); I and II. Prerequisites: Courses 101, 105, and 205. Miss Horn.

Aims of the course: (1) To become acquainted with the more important

sources of botanical literature, including the texts, monographs, etc., of noted authors; (2) to study the periodicals containing articles relating to botany; (3) to learn to use the publications containing citations and abstracts of papers; and (4) to become acquainted with the work of modern botanists by reviewing the articles appearing in current periodicals, experiment station reports, etc. Graduate students majoring in botany are expected to take the course. The subject may be continued the second semester for credit.

FOR GRADUATE CREDIT

301A. Plant Pathology III. 3(1-4, 2); I. Prerequisite: Course 205. Dr. Elmer.

A course in phytopathological technic; a close and extended study of the pathogenic organisms which cause plant disease; preparation of various kinds of culture media, isolation and culture of pathogenic organisms, nutrition of fungi, studies in enzyme secretion and action, micrometry, incubation and infection phenomena, etc. Charge, $5.

302. Plant Pathology IV. 3(0-7, 2); I, II, and SS. Prerequisite: Course 301A. Mr. Melchers and Dr. Elmer.

Original research, the problems being chosen by the student along some lines in which he is interested; a carefully worked-out report summarizing the results of the investigation a requirement. Charge, $2.

308. Investigations in Plant Taxonomy and Plant Ecology. 2(0-6) to 8(0-24); I and II. For prerequisites, consult the instructor. Dr. Gates.

Original research in a problem, chosen by or assigned to the student; results to be embodied in a written report presented at the end of the course. Charge, $2.

310. Research in Botany. 1 to 12 credits; I, II, and SS. Mr. Melchers, Dr. Miller, Mr. Davis, Dr. Haymaker, Dr. Gates, Miss Dalbey, Dr. Elmer, and Miss Horn.

Research problems in the various fields of botany may be outlined. A member of the department staff, acting as major instructor, is in charge. Upon completion of the work it may be submitted in part or as a whole toward the master's thesis. Charge, $3.50.

Chemistry

Professor King
Dean Willard
Professor Hughes
Professor Brubaker
Professor Colver
Associate Professor Tague
Associate Professor Latshaw
Associate Professor Keith
Associate Professor Brown
Assistant Professor Van Winkle
Assistant Professor Hall
Assistant Professor Perkins
Assistant Professor Harriss
Assistant Professor Titus

Instructor Wampler*
Instructor Pycha
Instructor Marlow
Instructor Andrews
Instructor McDowell
Instructor Ryan
Instructor Guest
Instructor Whittaker
Instructor Tyner
Instructor Smith
Instructor Marcy
Instructor Smits
Associate Food Chemist Collins

All of the industries are becoming more and more dependent for their highest success upon intelligent application of the physical and biological sciences, and the social sciences are making their greatest progress by tracing their phenomena back to the physical and chemical changes that accompany them. A study of chemistry and physics is therefore essential to any understanding of the processes of nature or of human industry. In the instruction in chemistry the aim is to insist upon a mastery of the chief concepts of the pure science through the agency of textbook drill, accompanied by demonstrations in the lecture room, and experimental observation by the student himself in the

* Absent on leave, 1927-'28.

laboratory. As the course proceeds, illustrations of chemical principles are drawn from the industrial processes of the chemical, agricultural, domestic, and other arts, thus impressing upon the mind the practical nature of the study. The ultimate object of instruction in this science is to develop in the student the power to form independent judgments upon the manifold problems of daily life in which chemistry plays a part.

The lecture rooms are amply equipped for experiments and demonstrations, and laboratories are designed to accommodate 936 students each semester in freshman work and qualitative analysis. The laboratories for more advanced work provide space for 324 students, and are well supplied with general and special facilities. The state work in foods, feeding stuffs, and fertilizers, and the chemical investigations of the Experiment Station in soils, crops, animal nutrition, etc., afford unusually good opportunities for students to obtain experience in practical chemistry. In all of the laboratory work the student is required to give the designated amount of time, and at least a certain amount of work must be satisfactorily performed in order to obtain credit.

The Department of Chemistry possesses equipment valued at $62,955.

COURSES IN CHEMISTRY

FOR UNDERGRADUATE CREDIT

101, 102. CHEMISTRY I AND II. 5(3-6) each; I and II, and SS., each. Not open to students who have credit in Chem. 105, 107, 108 or 110. Prerequisite: for II, Chemistry I. Dr. King, Dr. Keith, Miss Harriss, Mr. Wampler, Mr. Pycha, Mr. Marlow, Mr. McDowell, Miss Whittaker, Mr. Tyner, Miss Smith, and Dr. Smits.

I: The principal theoretical conceptions of chemistry, principles of nomenclature, significance of formulas, chemical equations, etc.; practical uses of the substances and processes used in metallurgy, engineering, agriculture, and other arts. Text: McPherson and Henderson, *A Course in General Chemistry* (the first 388 pages).

II: Completion of the study of general chemistry; general principles of qualitative analysis. Texts: As above, and Baskerville and Curtman, *Elementary Treatise on Qualitative Analysis.*

Laboratory.—I: Experiments touching preparation and properties of the more important substances performed independently by the student, the objects being here as in other courses to illustrate chemical phenomena, to teach care in manipulation, attentive observation, logical deduction, and discrimination and accuracy in recording results and conclusions. Deposit, $10.

II: Ordinary methods of separation and detection of the more common metals, nonmetals, acids, bases, and salts. Deposit, $10.

105. CHEMISTRY (VET.). 5(3-6); I and II. Not open to students who have credit in Chem. 101, 102, 107, 108 or 110. Dr. Smits.

Fundamental laws and theories of chemistry, elements and their inorganic compounds; emphasis on the application of chemistry to the arts and industries.

Laboratory.—Training in manipulation and first-hand knowledge of the important laws of chemistry and the properties of substances studied, by use of appropriate experiments performed by the student himself. Deposit, $10.

107, 108. CHEMISTRY E-I AND E-II. 4(3-3) each; I and II respectively. Not open to students who have credit in Chem. 101 and 102, respectively. Dr. King, Dr. Van Winkle, Mr. Pycha, Mr. Andrews, Mr. Ryan, and Mr. Marcy.

I: General chemistry; fundamental principles of chemistry which have a special bearing upon engineering and engineering material. Text: Deming, *General Chemistry.*

II: General chemistry and qualitative analysis. Text: As above.

Laboratory.—I: Experimental work on the topics considered in the classroom. Text: Van Winkle, *Combination Laboratory Manual and Notebook.* Deposit, $7.50.

II: Qualitative analysis; a systematic study of the chemistry of the more common metals and acids; analysis of alloys, minerals, and ores. Text: Deming and Arenson, *Exercises in General Chemistry,* supplemented by mimeographed notes. Deposit, $7.50.

110. General Chemistry. 5(3-6); I. Not open to students having credit in any college course in inorganic chemistry. Dr. King and Dr. Smits.

A general treatment of some of the principal laws and theories of chemistry; preparation, properties, and uses of some of the important metallic and non-metallic substances.

Laboratory.—Actual preparation and study of the properties of many of the elements and compounds mentioned in the lectures; applications of some of the laws. Deposit, $10.

121. Organic Chemistry (HE). 5(3-6); I and II. Not open to students who have credit in Chem. 106, 218 or 219, and for only two hours to those having credit in Chem. 123. Prerequisite: Chemistry II. Dr. Colver and Mr. Guest.

The more important classes of organic compounds, with special attention to those organic compounds which are used for clothing, fuel, light, antiseptics, disinfectants, anæthetics, medicine, solvents, in the commercial manufacture of other important products, as well as to many other compounds which contribute to a fuller understanding of the systematic relations existing among all organic compounds. Text: *Organic Chemistry.*

Laboratory.—Preparation of one or more representative examples of most of the classes of compounds taken up in the classroom; study of their physical properties and of their chemical properties as shown by typical reactions. Deposit, $10.

122. General Organic Chemistry. 5(3-6); I and II. Not open to students who have college credit in organic chemistry, except that it may be taken for two hours credit by students who have completed Chem. 123. Prerequisite: Chem. 105 or 110. Dr. Colver and Mr. Guest.

General study of some of the more important classes of organic compounds; a more detailed study of those hydrocarbons, alcohols, ethers, aldehydes, ketones, organic acids, waxes, fats, carbohydrates, and proteins which are of general interest to agricultural students. Text: Rice, *Organic Chemistry.*

Laboratory.—Preparation of a few organic compounds and the study of their physical and chemical properties. Deposit, $10.

123. Elementary Organic Chemistry. 3(2-3); I and II. Not open to students who have college credit in organic chemistry. Prerequisite: Chem. 105 or 110. Dr. Colver and Mr. Guest.

An elementary outline dealing with some of the more important hydrocarbons, alcohols, aldehydes, ketones, organic acids, and various esters, waxes, fats, carbohydrates, and proteins, with special emphasis on their toxological and physiological properties. Text: Phillips, *Fundamentals of Organic and Biological Chemistry.*

Laboratory.—Preparation of a few organic compounds and the study of their physical and chemical properties. Deposit, $7.50.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Inorganic Preparations. 1 credit for each 3 hrs. of laboratory; I and II. Prerequisite: Chemistry II. Dr. Brubaker.

Preparation and purification of some typical inorganic compound, of those of more complex composition, and compounds of the rarer elements. Charge, $10.

203, 204. Industrial Chemistry I and II. 5(3-6) each; I and II, respectively. Offered in 1927-'28 and alternate years thereafter. Prerequisite: Organic Chemistry. Dr. Brown.

The more important technical processes; general operations and the ma-

chinery employed; the more important commercial manufacturing industries, such as the production of alkalies, acids, glass, clay products, cement, paint, pigment, oils, varnish, soap, gas, paper, leather, etc. Text: Rogers and Aubert, *Manual of Industrial Chemistry.*

Laboratory.—Quantitative analysis of raw materials and industrial products. Text: Mahin, *Quantitative Analysis.* Charge, $10 for each course.

205. Industrial Electrochemistry. 2(2-0); II. Offered in case sufficient demand. Prerequisites: College courses in general chemistry and physics. Dr. Brown.

The principles of voltameters, electrochemical methods of analysis, electroplating, electrotyping, and the production of metallic objects by electroplating methods, electrolytic refining of metals, manufacture of various industrial products by electrolytic and electrothermic methods, etc. Text: Thompson, *Applied Electrochemistry.*

206. Physical Chemistry. 5(3-6); I. Prerequisites: Organic Chemistry and Quantitative Analysis; Calculus, though not a prerequisite, is recommended. Dr. King and Dr. Hall.

The modern conception of the atom and radioactive phenomena; relations with matter in the gaseous, liquid, and solid states; emphasis placed upon osmosis, solution including colloids, surface tension adsorption, equilibria, thermochemistry, ionization, hydrolysis, electromotive force, and hydrogen ion concentration.

Laboratory.—The laboratory follows the subject matter of the lectures very closely. Deposit, $10.

207. Advanced Inorganic Chemistry. 3(3-0); I. Prerequisite: Chemistry II. Dr. Keith.

A thorough study of the facts of chemistry and their theoretical interpretations according to the views of the present; special stress upon the properties of the elements as a basis for methods of classification, and upon the rarer elements and compounds. Students electing this course are advised to take course 202. Text: Mellor, *Modern Inorganic Chemistry.*

208. History of Chemistry. 1(1-0); II. Prerequisite: Chem. 206. Dr. Willard.

History of the development of the principal laws and theories of chemistry, with special emphasis upon the failures and triumphs of the founders of chemical science.

209. Surface Tension and Related Phenomena. 2(2-0); I or II, when requested by a sufficient number. Prerequisite: Chem. 206. Dr. King.

Methods of measuring surface tension; surface energetics; relation of surface tension to adsorption; and colloidal formation.

210. Chemical Statics and Dynamics. 2(2-0); II, when requested by a sufficient number. Prerequisites: Approved courses in physical chemistry and calculus. Dr. King.

Chemical equilibria, velocity of chemical reactions, hydrolysis, catalysis, etc.

211. Paint Oils and Pigments. 2(2-0); I, by appointment. Prerequisites: Satisfactory courses in organic chemistry and qualitative analysis. Dr. King.

Extraction, purification, and properties of the oils commonly used in paints; manufacture and properties of paint pigments; the products employed as protective coverings for both wood and metal.

213. Colloidal Chemistry. 2(2-0); II, when requested by a sufficient number. Prerequisite: Chem. 206. Dr. Tague.

Suspensoids and emulsoids, optical and electrical properties of colloids, Brownian movement, action of electrolytes on colloids, adsorption and surface phenomena, and a short review of the method for the preparation of colloids.

215. Chemical Thermodynamics. 3(3-0); II, when requested by a sufficient

number. Prerequisites: Approved courses in physical chemistry and calculus. Dr. Keith.

Those fundamental principles of thermodynamics which are particularly applicable to chemistry, such as the first and second laws of thermodynamics and their applications to fusion, evaporation, phase rule, chemical equilibrium, chemical affinity, electromotive force, surface tension, and adsorption.

216. Theoretical Electrochemistry. 3(3-0); II, when requested by a sufficient number. Prerequisites: Approved courses in physical chemistry. Dr. Keith.

The theory of electrolytic cells, the electrochemical series of metals, electrodes, potentials, polarization, overvoltage, and deposition of metals by electrolysis.

218, 219. Organic Chemistry I and II. 4(2-6) each; I and II, respectively. Prerequisite: Chemistry II. Dr. Colver.

I: The aliphatic hydrocarbons, alcohols, ethers, aldehydes, ketones, acids, esters, amides, and related compounds considered particularly from the standpoint of structure, methods of laboratory and commercial preparation, reactions and uses; special attention to such topics as structural, geometrical, and optical isomarism, and the use of acetoacetic ester in organic synthesis. Reference: Perkin and Kipping, *Organic Chemistry.*

II: Structure, methods of laboratory and commercial preparation, reactions and uses of the aromatic compounds, orientating influence of various groups; structure and reactions of the diazonium compounds; the different classes of dyes, the alkaloids, the terpenes, and a few heterocyclic compounds.

Laboratory.—I: Preparation, purification, and reactions of one or more typical examples of most of the groups of compounds studied in the classroom. Deposit, $10.

II: Various preparations that illustrate the reactions characteristic of aromatic compounds; determination of carbon, hydrogen, and nitrogen in pure unknown organic compounds by the combustion method. Text: Noyes, *Organic Chemistry for the Laboratory.* Deposit, $10.

223. Organic Preparations. 1(0-3) to 5(0-15); I. Prerequisite: Organic Chemistry II. Dr. Colver.

Such compounds prepared as give a thorough knowledge of the fundamental principles of synthetic organic chemistry. Deposit, $10.

224. Qualitative Organic Analysis. 2(0-6); II, when requested by a sufficient number. Prerequisite: Course 219. Dr. Colver.

Characteristic reactions of the various classes of organic compounds; class reactions, using known compounds; classification and identification of pure, unknown substances and mixtures. Text: Kamm, *Qualitative Organic Analysis.* Charge, $10.

225. Stereoisomeric and Tautomeric Compounds. 2(2-0); II, when requested by a sufficient number. Prerequisite: Organic Chemistry II. Dr. Colver.

Optical isomerism and methods of determining the configuration of the asymmeytic carbon atoms of sugar; geometrical isomerism; and ketoenol tautomerism.

226. Carbocyclic Heterocyclic Compounds. 2(2-0); II, when requested by a sufficient number. Prerequisite: Organic Chemistry II. Dr. Colver.

Structure, orientation, methods of synthesis, and reactions of benzene, napthalene, anthracene and derivatives; furane, pyrrol, thiophene, pyridine, quinoline, isoquinoline, purine, pyrimidine, hydantoin, and some structurally related substances.

228. Special Reactions of Organic Compounds. 2(2-0); when requested by a sufficient number. Prerequisite: Organic Chemistry II. Dr. Colver.

Some of the less common reactions which take place with certain aliphatic and aromatic compounds.

230. Principles of Animal Nutrition. 3(3-0); II. Prerequisite: Organic Chemistry. Dr. Hughes.

The relation of animals to matter and energy, and the physiological principles involved.

231. Physiological Chemistry. 5(3-6); I. Not open to students who have credit in Chem. 232 or 233. Prerequisite: An acceptable course in organic chemistry. Dr. Hughes.

The synthetic and analytical chemical changes that accompany the physiological processes of animals and plants. Text: Mathews, *Physiological Chemistry.*

Laboratory.—Practical work with the compounds and processes discussed in the classroom. Text: As above. Deposit, $10.

232, 233. Physiological Chemistry I and II. 5(3-6) each; I and II respectively. Not open for full credit to students who have credit in Chem. 231. Prerequisite: For I, Organic Chemistry; for II, course 232. Dr. Hughes.

I: Chemistry of the carbohydrates, lipins, and proteins, and the chemical changes which these undergo during the processes of digestion and metabolism.

II: Continuation of I; chemistry of the body tissues and excretions.

Laboratory.—I: Practical work with the compounds and processes discussed in the classroom. Deposit, $10.

II: Qualitative and quantitative study of the tissue and excretions of the body. Deposit, $10.

234. Biochemical Preparations. 5(0-15); II. Prerequisites: Organic Chemistry II, and Physiological Chemistry I. Dr. Hughes.

The isolation, purification, and analysis of a number of compounds which are of importance in biochemistry and nutrition. Deposit, $10.

235. Pathological Chemistry. 2(2-0); when requested by a sufficient number. Prerequisite: An approved course in physiological chemistry. Dr. Hughes.

The chemical facts involved in the causation, progress, and results of disease discussed under the following heads: Inflammation, degeneration, infection, anæmia, tuberculosis, dyspepsia, typhoid fever, jaundice, nephritis, diabetes, gout, rheumatism, and intoxication.

236A. The Chemistry of the Proteins. 3(2-3); I, when requested by a sufficient number. Prerequisite: An approved course in organic chemistry. Dr. Tague.

The chemistry of the proteins, particularly as regards their sources, isolation, purification and uses, their derivatives and degradation products. Deposit, $7.50.

238. Chemistry of Enzyme Action. 2(2-0); I. Prerequisite: Physical Chemistry. Dr. Hughes.

A brief review of catalysis; physical and chemical properties of enzyme preparations, and the reactions catalyzed by them.

240. Advanced Qualitative Analysis. 3(1-6); I, when requested by a sufficient number. Prerequisite: Chemistry II. Dr. Brubaker.

A systematic study of the properties of the acid and basic elements and their compounds as shown in a detailed study of systematic analysis; the application of chemical theory to analytical reactions. Deposit, $10.

241. Quantitative Analysis. 5(1-12); II. Prerequisite: Chemistry II or equivalent. Dr. Brubaker.

Practically the same as course 250 and 251. Deposit, $10.

242. Fire Assaying. 2(0-6); I. Prerequisite: Course 241. Dr. Brown.

The ordinary methods of fire assaying, with some attention to wet assaying. Fire assays of ores containing such metals as copper, zinc, lead, bismuth, tin, silver, and gold. Deposit, $10.

243. Gas Analysis. 1(0-3); I. Prerequisite: Quantitative Analysis. Dr. Brown.

Use of standard apparatus in analysis of gases; analysis of air, flue and furnace gases, and illuminating gas. Deposit, $7.50.

245. Microchemical Methods of Analysis. 1(0-3); given when requested by a sufficient number. Prerequisites: Organic Chemistry and Quantitative Analysis I. Dr. Brubaker.

The various methods of using the microscope in chemical analysis, both qualitative and quantitative, applied to both inorganic substances and to vegetable and animal products. Deposit, $7.50.

250, 251. Quantitative Analysis A and B. 3(1-6) each; I and II respectively. Prerequisites: For A, Chemistry II; for B, course A. Dr. Brubaker.

Course A: General procedures of gravimetric analysis; chemical theory as applied to quantitative reactions. Text: Mahin, *Quantitative Analysis*. Deposit, $10.

Course B: General procedures in volumetric analysis; preparation of standard solutions and their uses. Text: Same as for A. Deposit, $10.

252A. Chemistry of Soils and Fertilizers. 2(0-6); I. Prerequisite: Quantitative Analysis I, or equivalent. Dr. Perkins.

The most important chemical methods used in the analysis and investigations of soils and fertilizers. Deposit, $10.

253A. Chemistry of Crops. 2(0-6); II. Prerequisites: Organic Chemistry and Quantitative Analysis I, or equivalent. Dr. Perkins.

The most important chemical methods used in the analysis and investigations of substances present in plants and plant products. Deposit, $10.

254. Dairy Chemistry. 3(1-6); I. Prerequisites: Organic Chemistry and Chem. 250. Dr. Titus.

Chemical compounds present in milk, butter, cheese, and other dairy products; chemical changes effected by conditions of handling dairy products; a review of literature relating to recent investigational work in dairy chemistry.

Laboratory.—The most important chemical methods used in the analysis and investigation of dairy products. Deposit, $10.

256. Insecticides and Fungicides. 2(2-0); given when requested by a sufficient number. Prerequisites: Satisfactory courses in organic chemistry and quantitative analysis. Mr. Latshaw.

The manufacture of spray materials; the chemistry involved in mixing, and the theory of their toxic actions.

257. Food Analysis. 3(0-9); II, when requested by a sufficient number. Prerequisites: Organic Chemistry and course 250. Dr. Brubaker.

The quantitative methods employed in the analysis of foodstuffs; practice in testing for the presence of adulterants, preservatives, and coloring materials. Deposit, $10.

260. Advanced Quantitative Analysis. 1 credit for each 3 hrs. of laboratory; I. Prerequisites: Courses 250 and 251. Dr. Brubaker.

Included here, any kind of quantitative chemical work not otherwise designated; a large opportunity for advanced work afforded by the various research and state laboratories. Deposit, $10.

270. Chemistry Problems. 1 to 5 credits; I, II, and SS.

Individual problems to fulfill the thesis requirements of students in agricultural chemistry, biochemistry, and industrial curricula.

275. Chemistry Seminar. Once a week, throughout the year, the officers of the department, with the more advanced students and such others as wish to, meet for papers and discussion upon topics representing the progress of chemical science, chiefly as found in the current journals. The preparation of subjects for presentation at these meetings may be made a part of the credit work of advanced students.

FOR GRADUATE CREDIT.

301. CHEMICAL RESEARCH. Excellent opportunities are offered students to undertake research work in chemistry. Such work is being constantly conducted in the laboratories of the department in connection with the Agricultural and Engineering Experiment Stations. The State Food Laboratory and the laboratories for analysis of feeds and fertilizers are also accessible to students desiring research along such lines. Much emphasis is placed upon research in the department, and all graduate students whose training is adequate are encouraged to participate. Students working out their master's thesis in the Department of Chemistry are assigned to this course. Work is offered in the following lines:

Agricultural Chemistry. Dr. King, Mr. Latshaw, and Dr. Perkins.
Industrial and Engineering Chemistry. Dr. Brown and Dr. Van Winkle.
Analytical Chemistry. Dr. Brubaker and Mr. Latshaw.
Organic Chemistry. Dr. Colver.
Biochemistry. Dr. Hughes, Dr. Tague, and Dr. Titus.
General and Physical Chemistry. Dr. King, Dr. Hall, and Dr. Keith.

Economics and Sociology

Professor KAMMEYER
Professor BURR
Associate Professor ANDERSON
Associate Professor SPURRIER

Vocational training alone does not fully prepare a student for his life work, nor for the acceptable discharge of his duties as a citizen. It is necessary that he should have at least a general knowledge of the economic and social conditions under which he will live and work, in order that he may become a useful member of society. The state needs men and women trained for citizenship. It is the purpose of the Department of Economics and Sociology to plan and direct its work with this need in view.

A department library of well-selected books and pamphlets bearing on economics, sociology, and statistics is at the disposal of the students, and is used for collateral readings, book reviews, and reports.

The department owns equipment valued at $827.

COURSES IN ECONOMICS

FOR UNDERGRADUATE CREDIT

101. ECONOMICS. 3(3-0); I, II, and SS. Not open to students who have credit in 101, Agricultural Economics. Dr. Kammeyer, Mr. Anderson, and Mr. Spurrier.

An introductory study of the fundamental facts, concepts and principles pertaining to modern economic phenomena; a foundation course for all specialized studies in economics. Text: Ely, *Outlines of Economics.*

116. MONEY AND BANKING. 3(3-0); I, II, and SS. Prerequisite: Economics. Dr. Kammeyer and Mr. Anderson.

The nature, history, and functions of money; its place as a factor in man's economic progress, and its importance as such in his business activities as organized to-day; banking in its historic forms; the federal reserve system, the federal farm-loan system, and state banks; saving banks, trust companies, building and loan associations, and other institutional forms of credit. Text: Holdworth, *Money and Banking.*

122. ECONOMIC GEOGRAPHY. 2(2-0); I and SS. Mr. Anderson and Mr. Spurrier.

The major facts and principles relative to the origin, distribution, and development of the industries and commerce of the world. Text: Smith, *Commerce and Industry.*

126. Business Management. 2(2-0); I, II, and SS. Prerequisite: Economics, or may be taken concurrently. Dr. Kammeyer and Mr. Spurrier.

The business structure and executive functions—an analysis of management factors such as personnel, finance, accounting, production, and marketing. An elementary course covering the entire range of business endeavor. Text: White's, *Business Management.*

131. Cost Accounting. 2(2-0); I. Mr. Anderson.

A study of cost accounting principles and the principal types of cost systems now in use; methods of estimating and charging production, administrative and selling costs. Text: Castenholz, *Cost Accounting Procedure.*

FOR GRADUATE AND UNDERGRADUATE CREDIT

213. Public Finance. 2(2-0); II. Prerequisite: Economics. Mr. Anderson.

The major facts and principles relative to public expenditures; public revenues, especially taxation; the administration of public funds; fiscal emergencies and public indebtedness; the budget and other means of control over expenditures and revenues. Text: Hunter; *Outlines of Public Finance.*

217. Business Finance. 3(3-0); I. Prerequisite: Money and Banking (Econ. 116). Mr. Anderson.

Business financing, with special emphasis upon the problems of financing corporations; the securing of capital, internal financial management, financial methods in case of receivership and corporate reorganization.

221. Investments. 2(2-0); II and SS. Prerequisite: Money and Banking (Econ. 116). Mr. Anderson.

Financial types of investment securities; investment risks; effect of economic trends upon investment values; functions of investment banks; investment policies suitable for various investment classes.

229. Transportation Problems. 2(2-0); II. Prerequisite: Economics. Mr. Anderson.

A brief review of the development of transportation, followed by a study of the economic characteristics of the railroad industry, results of unrestrained competition in the industry, adoption of public regulation, and the legal and economic phases of regulation. Text: Jones, *Principles of Railway Transportation.*

233. Labor Problems. 2(2-0); I and II. Prerequisite: Economics or Sociology. Mr. Burr.

Present status and trends in industrial relations; the background in history and activities of labor organizations and employers associations; legislation bearing upon industrial relations; new problems of personnel administration, coöperation, profit sharing, industrial partnership, etc. Text: Atkins and Lasswell, *Labor Attitudes and Problems.*

242. Property Insurance. 2(2-0); II, SS. Prerequisite: Economics. Mr. Spurrier.

Fire, marine, automobile, title, and credit insurance, and corporate bonding; also other forms of property insurance, such as burglary and theft, plate glass, steam boiler, windstorm and tornado, etc. Text: Huebner, *Property Insurance.*

244. Life Insurance. 2(2-0); II, SS. Prerequisite: Economics. Mr. Spurrier.

Nature and uses of life insurance, kinds of policies, determination of premiums, reserves, surrender values, dividends, etc.; the organization and management of legal reserve companies, and important legal phases of life insurance. Text: Huebner, *Life Insurance.*

245. Marketing Practice. 2(2-0); II. Prerequisite: Economics. Mr. Spurrier.

Marketing functions, such as assembling and grading of products, storing, transportation, financing and risk taking, stimulation of demand, and mer-

chandising; marketing agencies and methods by means of which products are moved from producer to consumer; basic marketing systems; retailing as carried on by department, specialty, and chain stores, and mail order houses; marketing problems of the individual business; prices and price policies, sales planning and management, salesmanship, and advertising campaigns. Text: Converse, *Marketing Methods and Policies.*

248. Economic Problems. Credits and hours arranged by consultation with the head of the department. Prerequisites: Economics, and a two-hour course in advanced economics. Dr. Kammeyer, Mr. Anderson, and Mr. Spurrier.

251. Advanced Principles of Economics. 3(3-0); I and SS. Open only to seniors and graduates. Dr. Kammeyer.

A critical study of fundamental economic principles and the writings of leading economists of the past and present. The course is designed for mature students in the field of economics.

FOR GRADUATE CREDIT

301. Research in Economics. 1 to 10 credits; I, II, and SS. Prerequisites: Such courses as the problem undertaken may require. Dr. Kammeyer, Mr. Anderson, and Mr. Spurrier.

Graduate students who enroll in this course may elect for original investigation any acceptable problem in the general field of economics.

COURSES IN SOCIOLOGY

FOR UNDERGRADUATE CREDIT

151. Sociology. 3(3-0); I, II, and SS. Mr. Burr.

The fundamental principles of social life as related to other scientific principles; their practical application to social action and organization; normal constructive social evolution emphasized; the processes of socialization, social forces, and social control, particularly in their relation to commercial, industrial, and professional leadership. Text: Case, *Outlines of Introductory Sociology;* and Beach, *Introduction to Sociology.*

156. Rural Sociology. 3(3-0); I. Preferably, a course in sociology should precede this. Mr. Burr.

The fundamental principles of the science of sociology applied to rural society; social phases of agricultural and economic movements; the relation of nation, state and county to socializing projects in rural society. Text: Taylor, *Rural Sociology.*

FOR GRADUATE AND UNDERGRADUATE CREDIT

257. Social Problems. 2(2-0); I, II, and SS. Prerequisite: Sociology. Mr. Burr.

The social phases of population movements, dealing with the problems of quantity and quality; charity and reform organization and technique; professional social work. No text book.

267. Community Organization. 3(3-0); II and SS. Prerequisite: Sociology. Mr. Burr.

A study on a functional basis, of organizations working in the urban and rural fields; the principles involved and the technique of organization. The student has opportunity to choose for special study an organization or institution in which he hopes to have a position of leadership for his life work. Special assistance will be given in these special studies, which may afford the capable student valuable means of approach to future employment.

270. Advanced Rural Sociology. 3 credits. Prerequisite: Rural Sociology. Mr. Burr.

A continuation of Rural Sociology; a wide field of reading in the literature of rural life; original research work and a thesis required. Text: Lichtenberger, *Development of Social Theory.*

273. ADVANCED SOCIOLOGY. 3 credits; by appointment. Prerequisites: Course 151 (Sociology), and course 257 (Social Problems). Mr. Burr.

A continuation of sociology, covering a wide field of reading in this subject. Research work is carried on, and a thesis is prepared.

275. ECONOMIC AND SOCIAL SURVEYS. Credits and hours arranged in consultation with the head of the department. Prerequisite: Economics or Sociology. Mr. Burr.

Communities surveyed for the assembling of facts concerning trade, communication and transportation, church activities, school conditions, etc.

FOR GRADUATE CREDIT

351. RESEARCH IN SOCIOLOGY. 1 to 10 credits; I, II, and SS. Prerequisites: Such courses as the problem undertaken may require. Mr. Burr.

Graduate students who enroll in this course may elect for original investigation any acceptable problem in the field of sociology.

Education

Professor HOLTON
Professor ANDREWS
Professor WILLIAMS
Professor PETERSON
Professor STRICKLAND
Associate Professor BRAINARD*
Associate Professor DAVIDSON
Associate Professor RUST
Instructor MAUST
Instructor LANGFORD
Assistant HALL
Assistant ZIPSE
Doctor HOLTZ
Graduate Assistant HOCHULI

The courses in this department have for their controlling purpose the professional training of teachers. Two types of course are offered: (1) courses that give the broad, fundamental principles upon which public education is based, and (2) courses that develop technic and skill in school management and the organization of the subject matter of the curricula. All courses are based upon the proposition that education supported by public taxation should function in social and vocational efficiency. The department possesses equipment valued at $2,860.

The State Board of Education has set up the following standards or their equivalents for the certification of teachers:

1. Three-year Certificates Renewable for Life.
   a. Complete four years of college work with degree.
   b. At least eighteen hours of the four years' work must be taken in the Department of Education, as follows:
      (1) Three semester hours in Psychology or Methods, three in Educational Administration, and three in Educational Psychology.
      (2) Nine additional semester hours elected from the Department of Education, and approved by head of department.
   c. Credit obtained in college courses in the teaching of special subjects will be accepted to the extent of three semester hours to apply on the required credits in Education, provided that these courses are conducted with the approval of the College Department of Education and are offered in the junior or senior year, with preliminary preparation as follows:

      English.—Not less than fifteen semester hours of college credit, following at least three high-school units.

      Foreign Languages.—Not less than fifteen semester hours of college credit in the language in which the teachers' course is taken, following at least three high-school units or equivalent in some foreign language or languages.

      Mathematics.—Not less than fifteen semester hours of college credit, following at least two high-school units.

* Absent on leave, year 1927-'28.

Physical Science.—Not less than ten semester hours of college credit in the science in which the teachers' course is taken, following at least two high-school units or equivalent in physical science.

Biological Science.—Not less than ten semester hours of college credit in the science in which the teachers' course is taken, following at least two high-school units or its equivalent in biological science.

History.—Not less than ten semester hours of college credit, following at least two high-school units or equivalent.

In any of the above, six hours of college credit will be regarded as the equivalent of one high-school unit.

d. Valid in any elementary or high school in Kansas.

2. Three-year Certificates Renewable for Three-year Periods.
   a. Complete at least two years of College work, including three semester hours in Psychology, three in School Management, and three in Methods of Teaching or equivalent courses in the Department of Education.

      Not more than fifteen semester hours of education will be accepted on transcripts showing only sixty hours of credit.
   b. Valid in any elementary school, junior high school or high school offering not more than a two-year course of study.

3. Certificates for Teachers and Supervisors of Public-school Music.
   a. Complete at least two years of College work, including the following:

      (1) Not less than twenty-eight semester hours in technical courses in Music.

      (2) Three semester hours in Psychology, three in School Management, and three in Methods of Teaching.

      (3) Not less than eight semester hours in methods of Teaching Public-school Music.
   b. Valid for three years and may be renewed for three-year periods.

4. Certificates for Teachers and Supervisors of Physical Education.
   a. Complete at least two years of College work, including the following.

      (1) Not less than twenty-eight semester hours in the Department of Physical Education.

      (2) Three semester hours in Psychology, three in School Management, and three in Methods of Teaching.
   b. Valid for three years and may be renewed for three-year periods.

5. Certificates for Teachers and Supervisors of Manual Training.
   a. Complete at least two years of College work, including the following:

      (1) Not less than twenty-eight semester hours in the Department of Shop Practice.

      (2) Three semester hours in Psychology, three in School Management, and three in Methods of Teaching.
   b. Valid for three years and may be renewed for three-year periods.

6. Certificates for Teachers of Vocational Agriculture.
   a. Complete four years of College work, including the following:

      (1) Not less than forty-two semester hours in technical agriculture.

      (2) Eighteen semester hours in the Department of Education: viz., three in Psychology, three in Educational Administration, three in Educational Psychology, three in Vocational Education, three in Special Methods in Agriculture, and three in Supervised Observation and Teaching.
   b. Valid for three years and may be renewed for life.

7. Certificates for Teachers of Vocational Home-making.
   a. Complete four years of college work, including the following:
      (1) Thirty-four semester hours in technical home economics, as required in the curriculum in Home Economics, and six semester hours of electives: viz., three semester hours in Child Welfare, and three semester hours in Practice Work in Household Management.
      (2) Eighteen hours in the Department of Education: viz., three in Psychology, three in Educational Administration, three in Educational Psychology, three in Vocational Education, three in Special Methods in Home Economics, and three in Supervised Observation and Teaching.
   b. Valid for three years and may be renewed for life.

COURSES IN EDUCATION

FOR UNDERGRADUATE CREDIT

Psychology A, B and C are parallel courses in introductory psychology. The content of these courses is fundamentally the same, but emphasis differs according to the preparation and needs of the various groups of students as indicated below. Only one of these three courses may be taken for credit.

101. Psychology A. 3(3-0); I or II. Not open to juniors or seniors, or to those who have credit in courses 102 or 103. Mr. Brainard, Miss Maust, and Mr. Langford.

An introduction to the fundamental facts and principles of general psychology. The physiological and neural basis of behavior; innate and acquired tendencies to reaction; the nature of the learning process and the methods and conditions which favor rapid and effective learning; individual differences as related to vocational and personal efficiency.

102. Psychology B. 3(3-0); I. Not open to students who have credit in courses 101 or 103. Mr. Brainard.

Based on the same facts and principles as course 101, but draws largely from musical material for illustration and application; includes experimental work in the analysis and measurement of musical talent, and bears directly upon the teaching and learning of vocal and instrumental music.

103. Psychology C. 3(3-0); I or II. Not open to freshmen or sophomores, nor to students who have credit in courses 101 or 102. Dr. Peterson, Miss Maust, and Mr. Langford.

The same general content as course 101, with some additional materials in the application of psychology; more attention given to the methods by which new facts are discovered and interpreted.

105, 106. Educational Administration A and B. 3(3-0) each; I or II. Only one of these courses may be taken for credit. Dr. Andrews (A); Dr. Williams (B).

Course A: The organization of state, city and county school systems; organization of school systems in Kansas, both rural and city; the school laws of Kansas.

Course B: Similar to course A in that it discusses the general principles of educational administration in a democracy, but differs from it in that it gives special emphasis to the administration and supervision of vocational agriculture, home-making, and trades and industry.

107. School Management. 3(3-0); I or II. Limited to freshmen and sophomores. Dr. Andrews.

A survey of classroom and school administration and management of pupils in groups; problems of discipline, school sanitation and hygiene and school health, and general classroom efficiency. The student is shown how to develop an efficient classroom routine and class program.

109. Educational Psychology. 3(3-0); I or II. Prerequisite: General Psychology. Dr. Strickland.

The native equipment of human beings which serves as a basis for education, individual differences, and the psychology of learning.

111. Methods of Teaching A. 3(3-0); I or II. Prerequisite: General Psychology. Open to freshmen and sophomores only. Dr. Strickland.
Problems of general method in classroom procedure in grades and junior high school. Required of candidates for three-year certificate renewable for three year periods.

112. Methods of Teaching B. 3(3-0); I or II. Prerequisite: General Psychology. Open to juniors and seniors only. Dr. Strickland.
Problems of general method in classroom procedure from the high school viewpoint.

113. History of Education A. 3(3-0); I or II. Dr. Andrews.
An outline survey of the development of educational institutions and practice in Europe and America; emphasis upon institutional history rather than theory; the history of education as a conscious evolution of society.

118. Educational Sociology A. 3(3-0); I, II, and SS. Dr. Holton.
The controlling social principles in democratic institutions; the social objectives of education; the meaning of education in a democracy.

125. Vocational Education A. 3(3-0); I or II. Prerequisite: Course 105 or 106. Dr. Williams.
A comparative study of the provisions for the different phases of vocational education in Kansas and other states and countries, and of the principles underlying such education, with emphasis upon the relation of vocational education to the community, county, state, and nation, and the part to be played by each in its development. The aim of the course is to fit the student to plan, teach, and administer or supervise vocational work, especially in high schools.

132. Special Methods in the Teaching of Home Economics. 3(3-0); I or II. Prerequisites: Foods I and II, Clothing I and II, and Psychology. Mrs. Rust.
The principles of teaching applied to the selection and development of home-economics subject matter in lessons for all types of pupils, and to the conduct of laboratory and classroom exercises.

136. Special Methods in the Teaching of Agriculture. 3(3-0); II. Prerequisite: Psychology. Mr. Davidson.
Training in planning lessons, organizing materials, and conducting class, laboratory, and field instructional work in vocational agriculture is the purpose of this course. The individual and class project are studied, as well as the problem of coördinating farm mechanics work.

140. Special Methods in the Teaching of Industrial Arts Subjects. 3(3-0); II. Prerequisites: Mechanical Drawing II, Woodworking II, and Educational Psychology. Dr. Williams.
The various lines of work included under the head of industrial arts; a series of progressive lessons worked out in each of these lines, with emphasis upon important elements; the various materials employed and the methods of utilizing them for the needs of pupils; the arrangement of courses; the outlining and presentation of assignments; preparation of assignments; preparation of laboratory material and the conduct of laboratory exercises.

141. Special Methods in the Teaching of Physics. 3(2-3). Mr. Raburn.
(See Department of Physics, course 224.)

142. Special Methods in the Teaching of Mathematics. 3(3-0). Mr. Stratton.
(See Department of Mathematics, course 122.)

143. Special Methods in the Teaching of History. 2(2-0); I and II. Mr. Iles.
(See Department of History, course 127.)

144. Methods of Teaching English. 3(3-0); II and SS. Mr. Davis and Miss Rice.
(See Department of English, course 134.)

145. Special Methods in Arithmetic. 2(2-0); SS. Miss Hyde.
(See Department of Mathematics, course 123.)

150. History of Philosophy. 3(3-0); I. Prerequisite: Junior standing or better. Dr. Andrews.
The development of philosophy, its relation to general culture, scientific theory, education, and politics; a brief outline of philosophical thought from Thales to modern times. The purpose of the course: To help the student formulate values and interpret his own experience.

160. Supervised Teaching in Home Economics. 3 credits; I and II. Prerequisites: Foods I and II, and Clothing I and II; prerequisite or parallel; Educ. 132. Mrs. Rust.
Supervised teaching carried on in the home economics classes of the Manhattan high school.

161. Supervised Observation and Teaching in Agriculture. 3 credits; I and II. Prerequisites: Courses 109 and 136. Mr. Davidson.
Three weeks of observation and practice teaching in vocational agriculture classes in the Manhattan high school and other high schools by arrangement; group study of class-room problems; lesson plans and presentation criticized by the College instructor and the vocational teacher in the practice department.

163. Supervised Observation and Teaching in Science. 3 credits; I and II. Prerequisites: Methods of Teaching, or Educational Psychology, and at least ten hours of college credit in the science to be taught. Dr. Strickland.
Three weeks of observation and practice teaching in a science; group study of lesson plans, special methods and devices, organization of courses, etc.

170. Applied Psychology. 3(3-0); I or II. Prerequisite: Psychology. Dr. Peterson.
The psychological conditions of personal, industrial, and business efficiency as determined by observation and experiment in such special fields as advertising, salesmanship, employment, scientific management, etc.; use of psychological tests in employment, vocational guidance, etc.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Rural Life and Education. 3(3-0); I and II. Prerequisite: Educational Administration. Mr. Davidson.
Historical and social study of rural life; institutions and organizations that have contributed to rural life development; evolution from the one-room rural school to the rural high school and consolidated schools; farmers' organizations and all forms of organized community life in the open country, in relation to the problems of public education.

202. Extra Curricular Activities. 3(3-0); SS. Prerequisite: Educational Administration. Dr. Holton and visiting instructors.
A careful survey of the extra curricular activities in the junior and senior high schools; determination of the educational objectives of these activities and the most effective methods and means employed in the accomplishment of the objectives.

203. Problems in Teaching. 3(3-0); SS. Prerequisites: Educational Psychology, and senior or graduate standing. Visiting instructors.
What the superintendents expect of the teacher in (1) classroom instruction and standards, (2) attitudes and ideals, (3) coöperation and team-work, and (4) professional growth.

204. Rural Secondary Education. 3(3-0); I or II. Prerequisite: Educational Administration. Dr. Williams.

A brief historical study of rural secondary education with special emphasis on objectives of junior and senior high-school organization; curriculum and methods of organizing and conducting rural secondary schools; field problems in rural secondary education set up. A certain amount of field work is required.

205. The Junior College. 3(3-0); SS. Prerequisite: Educational Administration. Dr. Andrews and the dean of a junior college.
A study of the historical development of the junior college and its place in the American public school system; its curricula and administration; the present day trends in its development and extension.

206. Philosophy of Education. 3(3-0); II, SS. Prerequisite: Educational Sociology and Educational Psychology. Dr. Holton.
A critical study of the controlling and unifying philosophy of the American public school system and its European background.

208. The Psychology of Childhood and Adolescence. 3(3-0); I or II. Prerequisite: Psychology A, B, or C. Mr. Brainard.
A genetic study of the developing child with applications valuable to parents and teachers. The course is conducted in two sections: Section A, with emphasis on the psychology of childhood; and section B, with emphasis on the psychology of adolescence.

211. Mental Measurements. 3(3-0); I. Prerequisite: Psychology. Dr. Peterson.
The methods and devices employed and the more significant results so far obtained in the measurement of mental alertness, special aptitudes, and character traits.

212. Educational Measurements. 3(3-0); I or II. Prerequisites: General Psychology and Educational Psychology. Dr. Strickland.
The scientific measurement of achievement as distinguished from intelligence testing.

213. Abnormal Psychology. 3(3-0); II. Prerequisite: Psychology A, B, or C. Dr. Peterson.
Such manifestations of faulty integration of bodily activities and mental functions as are found in hysteria, dreams, hypnotism, trances, multiple personality, etc.; certain questionable concepts of abnormal psychology in current literature; prevalent practices in dealing with mental disorders.

216. Advanced Psychology. 3(3-0); I or II. Prerequisite: Psychology. Miss Maust.
Fundamental problems, methods, and interpretations of general psychology.

217. Experimental Psychology. 3(3-0); I or II. Prerequisite: Psychology A, B, or C. Dr. Peterson.
A few representative experiments in animal and sensori-motor learning, as an introduction to the types of problems encountered and to the basic methods of procedure essential to the analysis of the thought processes; a survey of the experimental literature on the higher mental processes, with special attention to the more objective studies in the experimental analyses of the thought processes.

219. The Curriculum. 3(3-0); I or II. Prerequisites: Six hours in education, and junior standing. Dr. Andrews.
The fundamental requirements of our modern life upon the schools; educational objectives in the light of these requirements; each subject in the curriculum examined for its minimum essentials both in the elementary school and in the high school.

221. Extension Methods and Problems. 2(2-0); II. Prerequisites: Educational Administration, and Vocational Education A. Dr. Williams and members of the Division of College Extension.
Origin and development of extension work, its aim and purposes, and its

relation to other general educational activities; organization and administration of extension work under the Smith-Lever law and the part taken by colleges and the Department of Agriculture; types of extension work conducted by bankers, railroads, manufacturers, and other agencies; and future problems of extension work.

223. Statistical Methods Applied to Education. 3(3-0); I, II, and SS. Prerequisites: Six hours in education, and junior standing. Not open to students who have credit in Math. 203. Dr. Andrews.

Aims of the course: To organize material and data of educational experience and research for statistical interpretation; to develop skill and confidence in the use of statistical methods; to provide discussions and interpretations of statistical methods employed in scientific studies in education; and to give experience in the computation of statistical constants and develop the ability of graphical representation and interpretation.

225. Foundations of Method. 2(2-0). Dr. Strickland.

A critical study of the underlying principles by which current methods of teaching may be evaluated and the development of method may be gained.

226. Vocational Education B. 3(3-0); I, II, and SS. Prerequisite: Educational Administration. Dr. Williams.

The administration and supervision of the different fields of vocational education, including agriculture, home-making, trade, and industrial and commercial education; curricula and curriculum building in the different vocational fields in relation to community needs.

230A. Vocational Guidance. 3(3-0); I, II, and SS. Prerequisites: Educational Administration, Psychology, and Vocational Education. Dr. Williams.

The best methods and practices now used in the field of pupil guidance in study of vocations and career planning; analysis of a number of the more desirable trades, professions, and business callings. Guidance problems of the elementary, junior high school, senior high school and continuation schools considered.

235. The Technic of Mental Testing. 3(1-6); I or II. Prerequisites or parallels. Courses 211 and 223. Dr. Peterson.

Methods of giving and scoring the Stanford Revision of the Binet Scale, with practice under the observation of the instructor until sufficient reliability is secured; the principal standard group tests of intelligence and special abilities analyzed and finally given and scored under observation; choice of tests for specific purposes; tabulation and interpretation of scores.

240. Social Psychology. 3(3-0); II. Prerequisites: Psychology A, B, or C. Miss Maust.

The reactions of individuals to the behavior of their fellow beings; the genesis and motivation of group habits, such as language, money, customs, conventions, fashions, laws, etc., and of group norms of capacity and achievement as they affect the relations of social classes, nationalities, and races.

243. Psychology and Personnel Management. 3(3-0); I. Prerequisites: A grade above M in Psychology A, B, or C, and consent of the instructor. Dr. Peterson.

Scientific principles and procedures involved in employment; promotion, motivation of work, measurement and reward of achievement, etc.

245. The Junior High School. 3(3-0); SS. Prerequisites: Six semester hours of Psychology and Education. Dr. Andrews.

Educational and social bases of the intermediate school, its method of teaching, its administration and discipline; the curriculum of the junior high school and its articulation with the elementary school and the senior high school.

250. Problems in Special Teaching Methods. 3(3-0); SS. Prerequisites: Psychology, and Special Methods of Teaching Home Economics. Mrs. Rust.

Objectives and principles involved in teaching subjects related to home eco-

nomics; planning of courses of study which are based upon the problem methods of teaching. (Designed for teachers of science and art related to vocational home-making, required in the Smith-Hughes high-school courses.)

253. Administration and Supervision of Secondary Schools. 2(2-0); 2d SS. Prerequisites: Psychology, Educational Administration, and Educational Psychology.

Problems of organization, administration, and supervision covering the complete program of an administrative head of a school system in a small city. (Designed for principals of rural high schools and superintendents of small city systems.)

255. The Project Method in Agricultural Education. 2(2-0); 2d SS. Prerequisites: Educ. 136 and 161. Mr. Davidson.

The project as a teaching device, with intensive treatment of project values, project analysis, project accounting, project supervision, project types, project results, project records, project reports, etc. The course is conducted on the problem basis.

257. Organization and Conduct of Class Projects. 2 credits; 2d SS. Prerequisites: Educ. 106 and 125. Mr. Davidson.

Fundamentals and principles on which productive class projects should be organized. Research and field work in class project study will be undertaken.

258. Administration and Supervision of Vocational Education. 2(2-0); 2d SS. Prerequisites: Educational Administration, Psychology, and Educational Psychology. Dr. Williams.

Objectives, curriculum organization and content, administrative and supervisory problems from the viewpoint of the city superintendent—leadership needs which must be met in a school system offering vocational education. The problem basis of treatment is used.

262. Community Problems in Vocational Agriculture. 2 credits; 2d SS. Prerequisites: Dr. Williams.

Methods, organization, and conduct of club work, junior project work, class projects, and community projects in general—a course conducted on the problem basis and designed specifically for teachers, supervisors, and directors of agricultural work.

FOR GRADUATE CREDIT

301, 302. Educational Seminar I and II. 4 credits for both (2-0); I and II, respectively. Prerequisites: Psychology, Educational Psychology, and Educational Administration. Dr. Holton and other members of the graduate faculty.

A topic for special investigation chosen by each member of the seminar early in the term; preliminary reports, and the final results of the study embodied in a carefully prepared report.

303. Educational Sociology C. 3(3-0); I, II, and SS. Prerequisites: Psychology, Educational Psychology, and Educational Sociology A. Dr. Holton.

Fundamental social objectives for the curricula in high schools and colleges. Research and critical study of curricula.

306. Educational Administration C. 3(3-0). Dr. Andrews.

Fundamental problems in public school administration are assigned to each student for investigation and report.

307. History of Education B. 3(3-0). Dr. Andrews.

The history of education in the United States, with a consideration of the more important present-day problems in the organization, administration, and adjustment of public education in the light of historical development.

310A. Psychology of Teaching and Learning. 3(3-0); I or II. Dr. Peterson.

An analysis of the various forms of learning and of the conditions favorable to the rapid development and effective functioning of knowledge, skills, attitudes, and purposes.

315. Supervision in Home Economics. 2 credits; by appointment. Prerequisites: Psychology, Special Methods in Teaching Home Economics, and experience in teaching home economics. Mrs. Rust.

Problems met by a supervisor or director of home economics in the public schools; standardization of work; relation of supervisor to teacher; modernization of plant and equipment; course of study, etc.

325. Research in Education. 1 to 10 credits; I and II. Members of Graduate Faculty.

Individual research problems in the general field of education and in the fields of psychology—mental testing, administration, and vocational education.

330. Agricultural Education B. 3(3-0); I or II. Dr. Williams.

A research survey course in the field of agricultural education required of all candidates for the degree of Master of Science whose major work in the Department of Education is in the field of agricultural education.

COURSES IN RELIGIOUS EDUCATION

The purpose of courses in religious education is twofold: To train students in the method of establishing social control through the implanting and careful nurture of ideals; and to serve as a basis for preministerial or prereligious vocational training.

FOR UNDERGRADUATE CREDIT

180. Religious Education A. 2(2-0); I. Dr. Holtz.

The origin of the Bible; the Bible as a social inheritance; Old Testament history with special emphasis upon the social message of the prophets; the New Testament with attention given to the social teachings of Christ.

182. Religious Education B. 2(2-0); II. Dr. Holtz.

The fundamental instincts; the physiological and psychological characteristics of the various stages of development; and the best methods of moral and religious instruction suited to these stages.

184. Religious Education C. 2(2-0); II. Prerequisite: Psychology. Dr. Holtz.

The recognized principles underlying modern religious education; organization of Sunday schools, the subject matter best adapted to each department of the organization, and the application of modern methods of teaching.

COURSES IN HOME ECONOMICS EDUCATION

(See Division of Home Economics)

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Problems in Organization and Presentation of Home Economics. 1 to 5 credits; I and II. Prerequisite: Senior or graduate standing. Dean Justin and Mrs. Rust.

This course permits opportunity for study of problems of organization and administration in this field.

FOR GRADUATE CREDIT

301. Research in Organization and Presentation of Home Economics. 1 to 10 credits; I and II. Prerequisite: Graduate standing. Dean Justin and Mrs. Rust.

Individual research problems in phases of organization and administration for home economics. May be chosen as the basis for thesis for the master's degree. The nature of the problem will depend upon the student's major interest.

English

Professor Davis
Professor Conover*
Professor Rockey
Professor Matthews
Professor Rice
Professor Faulkner
Associate Professor Sturmer**
Associate Professor Elcock
Associate Professor Breeden
Assistant Professor Garvey
Assistant Professor Rushfeldt
Assistant Professor Callahan
Assistant Professor Parker
Instructor Bower
Instructor Aberle
Instructor Bogue
Instructor Bundy†
Assistant Rosenthal

Ability to think accurately and speak well, and capacity to appreciate the world's best literature are recognized essentials of a liberal education. The work of the Department of English is to acquaint the student with the best standards of English practice and appreciation and to encourage him to maintain these standards in all his work. To this end the department offers studies in cultural and technical English and special drills in expressing thought freely and effectively in matters touching the vital interests of the student. The study of the English language and literature is thus made the means of increasing his power and efficiency.

The equipment owned by the department is valued at $1,991.

COURSES IN ENGLISH LANGUAGE

FOR UNDERGRADUATE CREDIT

101. College Rhetoric I. 3(3-0); I, II, and SS. Prerequisite: Three units of high-school English. Mr. Davis, Mr. Conover, Mr. Rockey, Mr. Matthews, Miss Rice, Mr. Faulkner, Mr. Breeden, Miss Sturmer, Miss Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, Mrs. Parker, Mr. Bundy, and Miss Rosenthal.

The improvement of students' written and spoken English by reviewing the principles of correct and effective diction, grammar, and sentence structure; by discussing models of good contemporary writing; by studying and practicing various types of paragraph; and by writing expository themes with guidance in selecting material, planning, writing, and revision. Texts: Thomas, Manchester, and Scott, *Composition for College Students;* Greever and Jones, *Century Collegiate Handbook;* Fulton, *Writing Craftsmanship.*

104. College Rhetoric II. 3(3-0); I, II, and SS. Prerequisite: Course 101. Mr. Davis, Mr. Conover, Mr. Rockey, Mr. Matthews, Miss Rice, Mr. Faulkner, Mr. Breeden. Miss Sturmer, Miss Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, Mrs. Parker, Mr. Bundy, and Miss Rosenthal.

The principles of argument, description, and narration, illustrated by standard and contemporary literature, and applied in frequent themes; correct form, structure, and diction of some common business letters; organization and writing of one extended composition. Texts: Thomas, Manchester, and Scott, *Composition for College Students;* Greever and Bachelor, *Century Collegiate Handbook;* Fulton, *Writing Craftsmanship.*

107. Special English. *(3-0); I and II, when need arises. Miss Rice, Miss Elcock, and Miss Aberle.

A review of English grammar, spelling, and diction with drill exercises, and individual consultations, required of students in courses 101 and 104 who show marked inability to write clearly and accurately. Text: Greever and Bachelor, *Century Collegiate Handbook.*

110. Engineering English. 2(2-0); I and II. Prerequisites: College Rhetoric II, and junior standing. Mr. Rockey, Mr. Matthews, and Mr. Faulkner.

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* Absent on leave, first semester, 1927-'28.
** Absent on leave, second semester, 1927-'28.
† Resigned.

The general problems of engineering writing: technical descriptions, and the exposition of ideas, mechanisms, and processes; the preparation of engineering talks, business letters, technical manuscripts, and reports. A brief review of composition essentials is included. Text: Watt and McDonald, *Composition of Technical Papers.*

113. Advanced Composition I. 2(2-0); I. Prerequisite: College Rhetoric II. Mr. Conover and Mr. Matthews.

Special emphasis given to exposition; subject selected from the student's particular field of work; exposition of mechanisms, processes, and general expository writing carefully studied. Text: Curl, *Expository Writing.*

116. Advanced Composition II. 2(2-0); II. Prerequisite: Advanced Composition I. Mr. Conover and Mr. Matthews.

Narrative writing both in its relation to the other forms of composition and as an independent form; practical forms of the narrative, special attention to the short story. Text: Chase and del Plaine, *The Art of Narration.*

122. Commercial Correspondence. 3(3-0); I, II, and SS. Prerequisite: College Rhetoric II. Mr. Davis, Mr. Faulkner, and Mr. Callahan.

A thorough review of the routine types of business correspondence; the writing of adjustment, credit, collection, and sales letters; the principles of effective writing as seen in the best writing in the commercial world. Text: Babenroth, *Modern Business English.*

123. Written and Oral Salesmanship. 3(3-0); I and II. Prerequisite: College Rhetoric II. Mr. Faulkner and Mr. Callahan.

Special attention to the writing of follow-up systems of sales letters and to the composition and display of circular material and catalogues; the basic principles of advertising and the psychology of selling; special practice in the various forms of sales talks; arrangements made for actual sales practice with commercial concerns. Texts: Kitson, *The Mind of the Buyer;* Ferris and Collins, *Salesmanship.*

128. Oral English. 3(3-0); I, II, and SS. Prerequisite: College Rhetoric I. Mr. Rockey and Mr. Matthews.

The principles of oral composition as applied to conversation and informal discussion; the correction of the grammatical faults of everyday speech; the application of rhetorical principles to informal speech and discussion. Subjects selected from the fields of painting, politics, music, and literature.

134. Methods of Teaching English. 3(3-0); II and SS. Prerequisite: College Rhetoric II. Mr. Davis, Miss Rice, and Miss Elcock.

The course of study, the application of English instruction to life needs, and definite methods of motivating English instruction especially considered. (For those called upon to teach English in connection with the applied sciences.) Text: Stratton, *The Teaching of English in the High School.*

137. Agricultural English. 3(3-0); I. Prerequisite: College Rhetoric II. Mr. Davis, Mr. Conover, Mr. Matthews, and Mr. Faulkner.

A brief review of the composition essentials, business correspondence, bulletin writing, the organization of short business talks, the principles of farm advertising; and writing the problems that confront the county agent, the high-school teacher of agriculture, and the farm manager.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Critical Writing. 3(3-0); II. Prerequisite: College Rhetoric II. Mr. Matthews.

Representative examples of criticism from English and American literature, from leading critics, and from standard newspapers and magazines; assignment to musical programs and art exhibits on the campus, and writing of reviews of books published by the faculty. Text: Bowman, *Contemporary American Criticism.*

207. Technical Writing. 2(2-0); II. Prerequisite: One of the following courses: 113, 116, 122. Mr. Davis, Mr. Conover, Mr. Matthews, and Mr. Faulkner.

Fundamental principles of technical and scientific writing, with such practice as will necessitate clearness, accuracy, and effectiveness.

223. Advanced Problems in Commercial Correspondence. 3(3-0); II. Prerequisite: Commercial Correspondence. Mr. Faulkner.

Problems in special types of business letters; writing of adjustment, credit, and collection letters; specialized study and writing of sales and business promotion letters; composition of form paragraphs, circular letters, and business reports; correspondence supervision. Text: Naether, *Problems in Business Correspondence.*

225. The Light Essay. 2(2-0); I and SS. Prerequisite: College Rhetoric II. Mr. Davis.

Much writing practice, with light essays and sketches from current standard magazines as models; the writing of humor.

251, 252. The Short Story I and II. 3(3-0) each; I and II respectively. Prerequisites: For I, English Literature; for II, The Short Story I. Miss Rice.

I: The world's best short stories; practice in writing sketches and short stories; special emphasis on the elements of the story—plot, setting, action, and characterization. Text: Pitkin, *How to Write Stories.*

II: Special stress on the preparation of the short story for publication; the short story in America, with special attention to types, characteristics, and tendencies; standards set by the leading magazines; market problems.

COURSES IN ENGLISH LITERATURE

FOR UNDERGRADUATE CREDIT

172. English Literature. 3(3-0); I, II, and SS. Prerequisite: College Rhetoric II. Mr. Davis, Mr. Conover, Mr. Rockey, Mr. Matthews, Miss Rice, Mr. Faulkner, Mr. Breeden, Miss Sturmer, Miss Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, Mrs. Parker, Mr. Bundy, and Miss Rosenthal.

The application of principles of literary appreciation to representative texts in narrative, lyric, and dramatic poetry, and to examples of the essay and the novel. Texts: Fulton, Bressler, and Mullin, *Questions on Readings in English Literature;* Pyre and Young, *Century Readings in English Literature.*

175. American Literature. 3(3-0); I, II, and SS. Prerequisite: English Literature. Mr. Davis, Mr. Conover, Mr. Rockey, Mr. Matthews, Miss Rice, Mr. Faulkner, Mr. Breeden, Miss Sturmer, Miss Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, Mrs. Parker Mr. Bundy, and Miss Rosenthal.

A study of American prose and poetry, the purpose being to acquaint the student with representative American writers by intensive study of illustrative selections, and to present the historical background and the tendencies of American literature. Texts: *A Short History of American Literature,* based upon the *Cambridge History of American Literature;* Pattee, *Century Readings in American Literature;* Hastings, *Syllabus of American Literature.*

181. History of English Literature. 3(3-0); I and II. Prerequisite: English Literature. Mr. Davis, Mr. Conover, Mr. Rockey, Mr. Matthews. Miss Rice, Mr. Faulkner, Miss Sturmer, Miss Elcock and Miss Aberle.

A study in the history of English literature, the object being to give the student a perspective of the field of English letters, and to study the works of authors in relation to their own periods. Texts: Moody and Lovett, *A History of English Literature;* Pyre, Dickinson, Young, *Student's Handbook in English Literature;* Cunliffe, Pyre, and Young, *Century Readings in English Literature.*

FOR GRADUATE AND UNDERGRADUATE CREDIT

260. Chaucer. 3(3-0); I. Prerequisite: English Literature. Miss Elcock.
The life, times, works, and characteristic language of Chaucer, with the emphasis upon the study of his principal works. Texts: Chaucer, *Complete Works;* Chaucer, *Selections* (Greenlaw).

262. Milton and the Puritan Revolt. 3(3-0); II. Prerequisite; English Literature. Miss Elcock.
The life and times of Milton and his chief works; the conflict in the seventeenth century between the reverence for authority in government, religion, and literature, and the growing spirit of intellectual inquiry. Texts: Milton, *Complete Poetical Works* (Moody); and Milton, *Of Education, Areopagitica, The Commonwealth* (Lockwood).

265. American Survey. 2(2-0); II. Prerequisite: Courses 172 and 175. Mr. Davis and Mr. Breeden.
An advanced study in the history of American literature beginning with colonial literature and continuing through the period of the Civil War down to the present time.

267. Kansas Literature. 2(2-0); I and SS. Prerequisite: American Literature. Mr. Callahan.
A study of the novels, short stories, essays, and poems written about the state. Especially the literature produced by Kansas authors.

271. The English Bible. 3(3-0); I, II, and SS. Prerequisite: English Literature. Mr. Conover.
The Bible as literature, with special stress on the narratives of the Old Testament, poetry, wisdom literature, and the book of Job. Text: Moulton, *The Modern Readers' Bible.*

273, 274. Shakespearean Drama I and II. 3(3-0) each; I and II, respectively. Prerequisite for each: English Literature. Mr. Davis and Miss Sturmer.

I. The life and times of Shakespeare and the background of Shakespearean tragedy; intensive study of five of Shakespeare's tragedies: Macbeth or Othello, Hamlet, King Lear, Coriolanus, and Romeo and Juliet. Texts: Baker, *The Development of Shakespeare as a Dramatist;* Brooke, Cunliffe, and MacCracken, *Shakespeare's Principal Plays.*

II: An intensive study of five of Shakespeare's comedies: The Winter's Tale, As You Like It, Twelfth Night, Cymbeline, and The Tempest; collateral readings of earlier comedy, Shakespearean comedy, that of his contemporaries, and present-day criticism of Shakespeare. Texts: Nielson and Thorndike, *The Facts About Shakespeare;* Brooke, Cunliffe, and MacCracken, *Shakespeare's Principal Plays.*

276. English Essayists of the Eighteenth and Nineteenth Centuries. 3(3-0); II. Prerequisite: English Literature. Mr. Davis and Mr. Conover.
Two periods of especially notable English prose. Among the authors discussed are Swift, Addison, Steele, Johnson, Burke, Lamb, Hazlitt, DeQuincey, Wilson, Newman, Ruskin, Spencer, Huxley, Pater, and Wilde. Text: Walker, *The English Essay and Essayists.*

278. The English Romantic Revival. 3(3-0); I. Prerequisite: English Literature. Mr. Rockey.
The chief poetical works of Wordsworth, Shelley, Keats, Coleridge, and Byron, with some consideration to the period as a revival of romanticism. Texts: Complete or selected poetical works of Wordsworth, Shelley, Keats, and Byron.

280, 281. World Classics I and II. 3(3-0) each; I and II, respectively. Prerequisites for each: English Literature and American Literature. Mr. Faulkner.

I: The literary masterpieces (in translation) of early times, particular attention being paid to Greek and Latin classics. Texts: Richardson and Owen, *Literature of the World;* Showerman and Cunliffe,*Century Readings in Ancient Classical and Modern European Literature.*

II: The literary masterpieces (in translation) of Western Europe, with particular attention to the works of Italian, Spanish, French, and German writings that have attained lasting world fame. Texts: Same as for I.

283. Contemporary Fiction. 3(3-0); I. Prerequisite: American Literature. Mr. Conover.

The more important British and American fiction since Hardy. Texts: Manley and Rickert, *Contemporary British Literature* and *Contemporary American Literature;* Van Doren, *Contemporary American Novelists.*

284. Contemporary Drama. 3(3-0); II. Prerequisite: American Literature. Mr. Conover.

Development of the drama since Ibsen; types of modern drama; works of important English, Irish, and American dramatists. Text: Dickinson and Crawford, *Contemporary Plays.*

286, 287. The Novel I and II. 3(3-0) each; I and II respectively. Prerequisites: For I, American Literature; for II, The Novel I. Mr. Breeden.

I: The English novel, its historic development, its relation to other forms of fiction, and its place in contemporary literature; especial attention to representative works of modern English and American writers. Text: Cross, *The Development of the English Novel.*

II: Continuation of The Novel I. Review of essentials in study of the novel; readings of representative modern novels continued; class reports.

288, 290. English Survey I and II. 2(2-0) each; I and II respectively. Prerequisites: For I, History of English Literature; for II, I. Mr. Davis, Mr. Conover, and Mr. Breeden.

I: An advanced study in the history of English Literature from Anglo-Saxon times down to the close of the Elizabethan period. Basic text: *The Cambridge History of English Literature.*

II: The rise of Puritanism and its influence on English literature; the classical movement emphasized; romanticism and its development. Basic text: Same as for I.

293. Browning and Tennyson. 3(3-0); II. Prerequisite: English Literature. Mr. Rockey.

Interpretation of the most important poetic and dramatic works of Alfred Tennyson and of Robert Browning. Texts: Tennyson, *Complete Poetical Works* (Cambridge edition); Browning, *Complete Poetical Works* (Cambridge edition).

297. Contemporary Poetry. 3(3-0); II, and SS. Prerequisite: History of English Literature. Mr. Davis and Mr. Conover.

A study of representative contemporary poetry. Texts: Untermeyer, *Modern American Poetry* and *Modern British Poetry.*

298. Problems in the Teaching of English. 3(3-0); SS. Prerequisites: 15 hours of English and 9 hours of Education. Mr. Davis and Miss Elcock.

The history of the teaching of English both in England and in America; an investigation of English curricula in representative high schools of the United States; and a thorough consideration of the subject matter for both composition and literature courses in the high-school teaching of English.

299. Research in English. Advanced students with acceptable fundamental training may, with the approval of the head of the department, undertake original investigation in some definitely prescribed field of English literature or applied English. Such work must be pursued under the direct supervision of some member of the faculty of the department, and the final results may be used to fulfill the thesis requirements for the master's degree. Students doing research in English will be required to give evidence of approved train-

ing in the subject and to have a broad general knowledge of English literature. Mr. Davis, Mr. Conover, Mr. Rockey, Mr. Matthews, and Miss Elcock.

FOR GRADUATE CREDIT

Classes in courses listed under the graduate group are organized whenever the demand for them is sufficient. When the demand does not justify the organization of a class, the work may be arranged for by appointment. Special arrangements for work should be made with the head of the department.

301, 302. HISTORY OF THE ENGLISH LANGUAGE I AND II. 2(2-0) each; I and II, respectively. Prerequisite: History of English Literature. Mr. Conover.

I: The origin and development of the English language, with special stress on Old English. Texts: Wyld, *Historical Study of the Mother Tongue;* Bright, *Anglo-Saxon Reader.*

II: A continuation of course 301, with special emphasis on Middle English and Modern English. Texts: Wyld, *Historical Study of the Mother Tongue;* Emerson, *Middle English Reader.*

304. RESEARCH IN APPLIED ENGLISH. 2(2-0); II. Prerequisite: History of English Literature. Mr. Davis.

Individual assignments in fundamental fields of research in applied English, an original investigation, and an acceptable report thereon being required.

315. RESEARCH IN THE LITERATURE OF INDUSTRY. 2(2-0); I. Prerequisite: History of English Literature. Mr. Davis and Mr. Conover.

This is an investigation and research course based on a careful study of the development of the distinctive literature of industry.

Entomology

Professor DEAN
Professor MCCOLLOCH
Professor SMITH
Associate Professor PARKER
Assistant Professor PAINTER
Instructor BRYSON

In all courses a special effort is made to make the student realize that he is studying living things which form a part of his daily environment, and upon which his welfare in many cases vitally depends. In courses in which both class and laboratory instruction is given, the closest correlation is striven for, and wherever possible the same form is studied simultaneously in laboratory and class. The student is led to integrate his classroom knowledge with local animal life by means of frequent and carefully planned field excursions and by the free use of vivaria in laboratory and museum. The courses offered are intended to awaken in the student a keen appreciation of the general principles underlying insect life, of the life economy of the more beneficial as well as the more injurious species, and of the general principles governing methods for their control.

Standard anatomical charts, a representative collection (especially of local species), a high-grade lantern for the projection of lantern and microscope slides, a large and excellent series of lantern slides (many of them colored), and a series of microscope slides are available for illustration. Compound and dissecting microscopes sufficient for the needs of laboratory classes have been provided.

Facilities for advanced work are provided for graduate students and others who expect to pursue the subject professionally. An advanced laboratory is equipped with individual desks, binocular microscopes, compound microscopes, rotary microtome, imbedding ovens, drawing apparatus, and a supply of glassware and reagents sufficient for histological work and for research. A well-equipped insectary is available for training in insectary methods. An air-conditioning machine in the insectary adds materially to the possibilities for experimental work. A field station with all the necessary equipment provides means for the study of insects under normal field conditions.

The department owns equipment valued at $21,276.

COURSES IN ENTOMOLOGY

FOR UNDERGRADUATE CREDIT

111. Apiculture. 3(2-3); II. Prerequisite: General Entomology. Dr. Parker.

A general study of the structure, life history, general behavior, activities, and products of the honeybee; practice beekeeping and best methods used among beekeepers; bee diseases and the standard methods to be used in their eradication and control; relation of bees to agriculture and horticulture. Charge, 75 cents.

116. Milling Entomology. 1(1-0); I. Mr. Dean.

Insect pests of flour mills, elevators, granaries, warehouses, and bakeries and standard methods of dealing with them; inspection trips to flour mills and warehouses.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Horticultural Entomology. 2(2-0); I. Prerequisite: General Entomology. Dr. Parker.

The most important insect pests of orchard, garden, and forest and standard methods of controlling their ravages.

203. General Entomology. 3(2-3); I, II, and SS. Prerequisite: General Zoölogy. Mr. Dean and Mr. Bryson.

The elementary anatomy and physiology of insects, complete enough to give a thorough understanding of the life history and habits of the most important species and the general principles upon which the control of these economic forms is based; the more important general facts about insects as a class; main characters of the different orders and groups; how they survive and multiply; and why measures of control differ for different groups. Charge, $1.

206. General Economic Entomology. 3(2-3); II. Prerequisite: General Entomology. Mr. McColloch.

The life history of the more important economic insects of field crops, methods to be used in dealing with them, and the literature of economic entomology.

Laboratory.—Practical problems in insect surveys, control, rearing, collecting, and life histories, in the course of which the student gains a first-hand acquaintance with the more important injurious insects at home in nature. Charge, 50 cents.

211, 212. Insect Morphology I and II. 3(1-6) and 3(0-9), respectively; 211, I; 212, I or II. Prerequisites: For I, General Entomology; for II, course 211. Dr. Smith.

I: The external anatomy of representative insects belonging to a number of orders, the types studied being selected to present the essentials of the structure of the exoskeleton and to afford a basis for the courses in taxonomy and for professional studies in hexapod morphology. Charge, $1.

II: The internal anatomy of representative insects, the dissections of which present the general plan and structure of the internal systems; one conference each week, with assigned readings in selected texts and papers. Charge, $1.

216. Principles of Taxonomy. 1(1-0); II. Prerequisites: (1) For students taking course 217, courses 203 and 211; (2) for students taking General Zoölogy. This course must be taken with course 217 or with one of the taxonomic courses in zoölogy. Dr. Smith.

Fundamental principles of zoölogical taxonomy. In detail: Systems of classification; terminology of taxonomic groups; criteria of species and genera; binomial nomenclature, pre-linnaean and modern nomenclature; international code of zoölogical nomenclature, and other codes; laws of priority; professional ethics and modern tendencies in taxonomy.

217, 218. Taxonomy of Insects I and II. 2(0-6) and 3(0-9), respectively; II each. Prerequisites: For I, General Entomology and Insect Morphology I. Principles of Taxonomy must be taken with this course. For II, Taxonomy of Insects I. Dr. Smith.

I: Practice in the determination of insects, at least of all the major orders to genera, sometimes species; an acquaintance with the most useful taxonomic literature in each group and the use of catalogues. Charge, $1.

II: A group is selected, and intensive study of the insects and literature of the group is made in order to become proficient in their determination. Charge, $1.

221. Advanced General Entomology. 3(3-0); II. Prerequisite: General Entomology. Dr. Smith and Dr. Painter.

A comprehensive view of the broad biological aspects of the subject and an understanding of the relation of insects to the complex of environmental factors; the various subdivisions of entomology correlated and used as a basis in the presentation of general principles as well as illustrating the problems of maintenance and the various ways in which insects have solved them.

226. Medical Entomology. 3(2-3); I. Prerequisites: General Entomology. Dr. Smith.

Insects and other arthropods as parasites and disseminators of diseases of man and domestic animals; the life cycles, biology and control of insect parasites.

Laboratory.—A detailed study in order to recognize the various stages of the insect parasites of man and domestic animals; a study of the organisms of insect-borne diseases; house fumigation and observation of local sanitation problems bearing on the subject. Charge, $1.

227. Advanced Apiculture A. 3(2-3); SS. Prerequisite: Apiculture. Dr. Parker.

A continuation of apiculture. The principles of bee behavior studied under actual conditions during the active season; practical work in the manipulation of bees during the production of the honey crop, in swarm-control methods, and making increase in the colony; queen rearing. Charge, 50 cents.

228. Advanced Apiculture B. 3(2-3); I. Prerequisite: Apiculture or its equivalent. Dr. Parker.

A continuation of Apiculture. The principles of bee behavior, and how these are related to practice of good beekeeping; preparation for wintering, feeding for winter, and winter protection; merits and demerits of different systems of wintering; extracting honey, preparing it for market, marketing, and other advanced subjects. Charge, 50 cents.

231. Entomological and Zoölogical Literature. 2(2-0); I. Prerequisite: General Entomology. Dr. Smith.

The literature of entomology which is inseparably associated with that of zoölogy and hence of equal importance to students of both subjects; general and special biographical sources; foreign and American scientific journals and serials; the construction of special bibliographies according to approved methods; a study of the biographies of leading world biologists of all ages and their publications, particularly of those in the College library. All advanced students of entomology and zoölogy are expected to take this course.

234. Insect Physiology. 2(2-0); given when requested by two or more students. Prerequisites: Insect Morphology II, Cytology or Histology, and Physiological Chemistry. Dr. Parker.

Physiology of the cell, respiration, metabolism, reproduction, muscular activity, nervous responses, sense organs and senses, circulation, glandular system, and the metamorphosis of insects.

236. Zoölogy and Entomology Seminar. 1(2-0); I and II. For prerequisites, consult seminar committee.

Presentation of original investigations, reviews of papers appearing in current journals, summaries of recent advances in various fields, and discussion of various aspects of the fundamental problems of modern biology.

238. Entomological Problems. 2 to 4 cr.; I and II. For prerequisites, consult instructors. Mr. Dean, Mr. McColloch, Dr. Parker, Dr. Smith, Dr. Painter, and Mr. Bryson.

Students having sufficient training may, with approval of the head of the department, pursue under the direct supervision of some members of the departmental staff a special problem in one of the following subjects: Insect life history, insect control, insect classification, apiculture, insects injurious to stored grain and milled products, and household insects.

FOR GRADUATE CREDIT

316. Research in Entomology. Prerequisites: (1) For research in taxonomy and morphology, Entomology 203, 211, 217, and Cytology; (2) for research in economic entomology, Entomology 203, 206, and 217. Mr. Dean, Mr. McColloch, Dr. Parker, Dr. Smith, Dr. Painter, and Mr. Bryson.

With the approval of the head of the department, advanced students having sufficient fundamental training may undertake original investigation in one of the following fields of entomology: Taxonomy, morphology, economic entomology. Such work is pursued under the direct supervision of some member of the departmental faculty and the final results, if of sufficient merit, may be used to fulfill the thesis requirement for the master's degree. If willing and capable, special students may be drawn into the research work of the Agricultural Experiment Station during the summer vacation and receive training in the investigation of economic problems.

Geology

Professor Sperry

The materials and agencies that have made the earth are studied in the field and class, and by means of maps, charts, and specimens. The purpose in these courses is to arouse in the student an appreciation of the general principles involving a study of the structure and history of the earth and the forces at work on it.

Some charts, a series of lantern slides, a representative collection of fossils, minerals, and rock specimens, and a surrounding country rich in fossils and exhibiting considerable variety of hill, valley and stream, limestone, glacial drift, sand dunes and two igneous outcrops, are available for illustrative purposes.

COURSES IN GEOLOGY

FOR UNDERGRADUATE CREDIT

102. Engineering Geology. 4(3-3); I (2 credits only for students who have credit in Geol. 103). Prerequisite: Chem. 105, or equivalent. Mr. Sperry.

The general principles of structural and dynamic geology; rocks in respect to their mineral composition, structural properties, changes in weathering, etc. Text: Ries and Watson, *Engineering Geology.*

Laboratory.—Observation and description of such structural and dynamic features as the locality affords; study of topographic and geologic maps and of the principal rocks and their constituents; occasional excursions to distant points. Charge, $1.50.

103. General Geology. 3(3-3 or 4 field trips during the semester); I and II. Not open to students having credit in Geology 102. Prerequisite: High school or general chemistry. Mr. Sperry.

The structure of the earth; the agencies which modify the materials and determine the topographic features; some of the history as indicated by the records in the rocks; rock-forming minerals. Text: Cleland, *Physical and Historical Geology.* Charge, $1.50.

FOR GRADUATE AND UNDERGRADUATE CREDIT

203. Historical Geology. 4(3-3); II. Prerequisites: Course 102 or 103. Mr. Sperry.

The procession of physical and biological events through which the earth has gone, with stress on the philosophical side of earth history. Text: Pirsson and Schuchert, *Textbook of Geology,* Part II.

Laboratory.—Collection and study of local fossils, and their application in the identification of the rock measures; study of museum specimens and of paleogeographic maps. Charge, $1.50.

207. Economic Geology. 4(3-3); I. Prerequisites: General Geology and General Chemistry. Mr. Sperry.

The origin and mode of occurrence of nonmetallic minerals, including coal and petroleum, and of metallic mineral deposits. Text: Emmons, *Principles of Economic Geology.*

Laboratory.—Identification and study of the ore-forming minerals; map studies of the economic areas. Charge, $1.50.

209. Crystallography and Mineralogy. 4(2-6); I. Prerequisites: General Geology, and General Chemistry. Mr. Sperry.

The fundamentals of crystallography, physical mineralogy, and blowpipe analysis for the identification of minerals. Text: Kraus and Hunt, *Mineralogy.* Charge, $1.50.

History and Government

Professor Price
Professor Iles
Professor James
Associate Professor Correll
Associate Professor Shannon
Associate Professor Williams
Assistant Professor Alsop
Assistant Professor Parrish

Training for citizenship, breadth of view, historic-mindedness, fairness of judgment and general culture are constant and specific aims of each course offered by the Department of History and Government. As a result of the training received in these courses the student is better prepared to understand and appreciate the institutions in the midst of which he lives and of which he is a part. He is also prepared to act more wisely his part as a leader in good citizenship wherever his lot may be cast. In our modern age and self-governing nation, and in an institution supported by the state and nation, it would seem to be the imperative duty of every student to secure specific training for wise and effective leadership in the governmental affairs of the state and nation that are thus preparing him for life and its duties.

Equipment valued at $1,189 is owned by this department.

COURSES IN HISTORY

FOR UNDERGRADUATE CREDIT

101. Ancient Civilization. 3(3-0); II and SS. Mr. Parrish.

Special attention to the life and institutions, the art and literature of Greece and Rome. The state text in this subject is given critical consideration, one specific object of the course being to assist those who teach ancient history in the high schools.

102. Medieval Europe. 3(3-0); I and SS. Mr. Parrish.

A continuation of course 101, with similar objective. Medieval institutions are studied with a view better to understand and to appreciate our modern world.

103. American History Lectures. 0(2-0); SS. Mr. Price.
A series of lectures on American history; no recitations and no examinations; based on Price, *An American History Notebook.*

105. American Industrial History. 3(3-0); I, II, and SS. Not open for credit to students who have credit in course 203. Dr. Shannon.
History of American agriculture, manufactures, and commerce with related activities from their colonial beginnings to the present; survey of the physical basis for American history, the growth of population and its expansion across the continent, and the reflection of these things on our industrial, social and political life; European developments, as a side light on American history; growth of our national industrial organization and its present-day aspects. Text: Faulkner, *American Economic History.*

110. History of Commerce and Industry. 3(3-0); I. Dr. Shannon.
The evolution of industry and commerce from primitive beginnings to present-day organization traced in broad outline, and economic survey of world history, with special stress on the modern period.

115. Modern Europe I. 3(3-0); I or II. Miss Alsop.
The evolution of modern institutions from the close of the renaissance to the opening of the nineteenth century, the principal movements being the commercial revolution through which European trade turned from Mediterranean to Atlantic ports; the Reformation; the earlier phases of the development of political democracy through the Puritan revolt in England and the French Revolution; and the Napoleonic era. Text: Hays, *Political and Social History of Modern Europe,* Vol. I.

121. English History. 3(3-0); I, II, and SS. Not open for credit to students who offer English history for entrance. Mr. James.
A general survey of the whole field of English history, including the outlines of political history and the essentials of English constitutional development and stressing the development of the empire, the English background of American history, and the industrial and social development of the English people. Text: Cross, *A Shorter History of England and Great Britain.*

126. Current History. 1(1-0); I, II, and SS. May not be taken more than four semesters for credit. Mr. Price, Mr. Iles, Mr. James, Mr. Correll, Dr. Shannon, Mr. Williams, Miss Alsop, and Mr. Parrish.
The essentials of American and foreign governments, of international relations, of internationl law, of biography, of industrial developments, and of the larger world issues as they appear in current news reports, giving a wide outlook on the world of to-day and a better understanding of conditions and institutions in the midst of which we live. Texts: *The Review of Reviews,* and *Current History,* supplemented by background material and especially important daily news.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. American History I. 3(3-0); I, II, and SS. Prerequisite, when taken for graduate credit: Three credits of college history. Mr. Price.
Beginning of the American nation: The origin and development of American nationality and democracy to the end of the War of 1812, with special stress on the industrial phases, but including our constitutional and political development, with the European background in each case. Text: R. R. Price, *An American History Notebook.*

202. American History II. 3(3-0); I, II, and SS. Not open for undergraduate credit to students who have credit in course 206. Prerequisite, when taken for graduate credit: Three credits of college history. Mr. Price.
Western expansion and sectionalism: The industrial conditions, the issues, and the leaders of the middle period of our history, from the close of the War of 1812 to the Civil War. Text: R. R. Price, *An American History Notebook.*

203. American History III. 3(3-0); II and SS. Not open for undergraduate credit to students who have credit in course 105. Prerequisite, when taken for graduate credit: Either course 201 or course 202. Mr. Price.

The new industrial age: Review of the industrial conditions in America just before the Civil War; industrial effects of that war; the political and governmental activities of the last half century in the light of the industrial conditions and developments of that period. Text: R. R. Price, *An American History Notebook.*

204. American Agricultural History. 3(3-0); I and SS. Prerequisite, when taken for graduate credit: Three credits of college history. Dr. Shannon.

European background and Indian beginnings; agricultural development during the colonial period; the westward movement into the prairie regions of the Mississippi valley, with the distinctive American developments in methods, live stock, and especially farm machinery; the last quarter-century with its varied industries, more intensive farming, and higher cost of living. Text: Schmidt and Ross, *Readings in the Economic History of American Agriculture.*

206. American Political History. 2(2-0); I. Intended to supplement course 105 or 204. Prerequisite, when taken for graduate credit: Three credits of college history. Mr. Iles.

Origin, development, leaders, and function of political parties in America; issues and results of the more important presidential elections; growth of nationality and development of self-government through American history, with special reference to present tendencies. Text: Woodburn, *Political Parties and Party Problems in the United States.*

207. Latin America. 2(2-0); I, II, and SS. Prerequisite, when taken for graduate credit: Three credits of college history. Mr. James.

History, government, and industrial and social conditions of Mexico, Central America, and the South American nations; the interrelations of each of these and the United States; particular attention given to contemporary Latin America. Text: James and Martin, *The Republics of Latin America.*

223. Modern Europe II. 3(3-0); I, II, and SS. Prerequisite, when taken for graduate credit: Course 115. Mr. Parrish.

Evolution of the modern European nations since 1814, with special attention to political organization, industrial development, and colonial expansion; political problems and social and economic adjustments due to the Great War. Text: Hayes, *A Political and Social History of Modern Europe,* Vol. II.

224. Twentieth Century Europe. 2(2-0); I, II, and SS. Prerequisite, when taken for graduate credit: Course 223. Mr. Correll.

Causes of the World War; the nations that entered it and why; new methods and cost of war; the making of the treaty and its provisions; membership, and reconstruction and adjustment since the war. Text: Slossen, *Twentieth Century Europe.*

225. History of the Home. 3(3-0); II. Prerequisite, when taken for graduate credit: Three credits of college history. Miss Alsop.

The primitive family; the Hebrew family; family life of the Greeks and of the Romans; the home and family life during the Middle Ages, including the influence of the Christian church; the English family in the seventeenth and eighteenth centuries; the American colonial home; the industrial revolution and its effects upon family life; the family during the nineteenth century; the present situation and tendencies. Text. Goodsell, *History of the Family.*

226. The British Empire. 2(2-0); II. Prerequisite: For undergraduates, entrance credit in English history or three credits of college history; for graduate credit, the latter. Mr. James.

The English phase of the European expansion movement, with consideration to the forces and influences promoting the "swarming of the English" overseas; growth and development of the English provinces into self-governing

colonies and the union of these into practically independent dominions; the drawing together of the widely scattered English people into a British Commonwealth of Nations, and the significance of this fact in the struggle for democracy.

228. Immigration and International Relations. 2(2-0); I. Prerequisite, when taken for graduate credit: Three credits of college history. Mr. Price.

Causes and effects—economic, social, and political—of the coming of the foreigner to our shores, from the colonial period to the present, with special reference to the recent changes as to the character of the immigrants and as to the conditions in Europe and in America that affect the number and quality of immigrants; a clear survey of the important epochs in our diplomatic history. Texts: (1) First part based on such works as Orth, *Our Foreigners,* and Fairchild, *Immigration—A World Movement and Its American Significance;* (2) For second part, Adams, *A History of the Foreign Policy of the United States.*

229. History of the Far East. 2(2-0); I. Prerequisite, when taken for graduate credit: 3 units of college history. Mr. Parrish.

Lands and people of Asia; rise and development of cultures in India, China, Korea, Japan, Malaysia, and Indo-China; rise and decline of Asiatic expansion; the various contacts of the West with the East, and the contributions which each has made to the other; present foreign and domestic problems of the Far East peoples.

231. History of Religions. 2(2-0); II. Prerequisite, when taken for graduate credit: 3 credits of college history. Mr. Parrish.

Rise and growth of historic religions which influence most of the peoples of the world to-day; relation of each religion to race, physical environment, and advance in culture; the leading personalities, religious conceptions, and historic events and movements which modify life and thought in Hinduism, Buddhism, Confucianism, Taoism, Zoroastrianism, Mohammedanism, Judaism, and Christianity.

232. Problems in History Instruction. 2(2-0); SS. May be taken for three graduate credits, in which case ten credits in history and nine credits in education are prerequisites, and a series of problems must be worked out from first-hand material. Mr. Iles or Dr. Shannon.

The different texts in history and civics critically compared as to points of excellence or weakness, including lectures on the content and viewpoint of each; the best available illustrative material and helps in the teaching of history and civics; evolution in the writing of history; the growing importance of history and civics in the modern school curriculum; the improving viewpoint as to content of both the history and civics courses; for the more advanced students, special attention to the bibliography of history, to the better known collecions of sources, and to the more approved methods of taking and using notes in teaching history. Text: Tryon, *The Teaching of History in Junior and Senior High Schools.*

250. Seminar in History and Government. 2 to 5 credits; I, II, and SS. Prerequisite: Six credits of college history of a type that will serve as a proper background for the subject to be studied. Mr. Price, Mr. Iles, Mr. James, Mr. Correll, Dr. Shannon, and Mr. Parrish.

Preference to special fields connected with the history of agriculture, of industry, or of commerce, though other fields may be studied at the discretion of the department.

FOR GRADUATE CREDIT

301. Research in History. 1 to 6 credits; I, II, and SS. For prerequisites, consult instructor. Mr. Price, Mr. Iles, Mr. James, Mr. Correll, Dr. Shannon, and Mr. Parrish.

Individual research problems in European or American history, including international relations. Conclusions will generally take the form of a thesis.

COURSES IN GOVERNMENT

FOR UNDERGRADUATE CREDIT

151. American Government. 3(3-0); I, II, and SS. Not open to students having credit in History and Government 152 or 153. Mr. Iles.

A definite review of the fundamental principles and operations of our state and national governments, including the principles of constitutional law, but giving special emphasis to present-day conditions and movements in our governmental and political life. Texts: Munro, *The Government of the United States;* and Mott, *Materials Illustrative of American Government.*

152. American National Government. 3(3-0); I. No credit for students having credit in course 151. Mr. Iles.

The mechanism, functions, and control of the government of the United States, with considerable attention to principles and problems. With course 153, this course affords a comprehensive study of American national, state, and local government.

153. American State Government. 3(3-0); II. No credit for students having credit in course 151. Mr. Iles.

State and local government, with special attention to functions and problems.

155. Our National and State Constitutions. 2(2-0); SS. Mr. Iles and Mr. Williams.

The state texts, supplemented by an abundance of illustrative material intended to be specifically useful in presenting the subject to pupils. For teachers required by law to teach the constitution of the United States; of value also to those preparing for a course in law.

160. Commercial Law. 1(1-0); I and II. Mr. Williams.

The most elementary principles of contracts, agency, sales, and negotiable instruments. Business Law A may be substituted for Commercial Law, where the requirements of the curricula permit, and the extra credit used as an elective. Text: Bays, *Business Law.*

161. Business Law A. 2(2-0); I, II, and SS. Mr. Williams.

Contracts, agency, and sales. The case method of study is used. Casebook: Britton and Bauer, *Cases on Business Law.*

162. Business Law B. 2(2-0); II. Prerequisite: Course 161. Mr. Williams.

Negotiable instruments, partnership, and corporations. Casebook: Britton and Bauer, *Cases on Business Law.*

175. Farm Law. 2(2-0); I. Mr. Williams.

A study of the particular rules, in various fields of law, a knowledge of which is most useful to the conduct of the business of a farmer. The course is based on a study of cases decided by the Kansas supreme court.

FOR GRADUATE AND UNDERGRADUATE CREDIT

252. Comparative Government. 2(2-0); I. Mr. Iles.

The leading features, especially with regard to administration, of certain European governments such as England, France, and Germany, and a comparison of essential feature with government in the United States. (A supplement to the course in American Government.) Text: Macy and Gannaway, *Comparative Free Government,* or *Holt's Introduction to the Study of Government.*

256. International Law. 2(2-0); II. Mr. James, and Mr. Williams.

Fundamental principles of international law and international relations; public and private rights and obligations in time of peace and in time of war, especially in the light of recent developments, such as the Hague conference. Text: Fenwick, *International Law.*

260. GOVERNMENT REGULATION OF BUSINESS. 2(2-0); II. Prerequisite, when taken for graduate credit: Course 151, 152, or 153. Mr. Williams.

Government powers; trade regulations; labor unions; protection of debtors; business affected with a public interest; conservation of natural resources; vested rights; confiscatory legislation; and certain positive governmental activities.

FOR GRADUATE CREDIT

351. RESEARCH IN GOVERNMENT. 1 to 6 credits; I, II, and SS. For prerequisites in each case, consult instructor. Mr. Price, Mr. Iles, Mr. James, Dr. Shannon, and Mr. Williams.

Individual research problems in national or local government, American or European, including studies in comparative government or international law. The conclusions generally take the form of a thesis.

Industrial Journalism and Printing

Professor ROGERS
Professor KEITH
Associate Professor BROWN
Assistant Professor AMOS
Assistant Professor CHARLES
Assistant Professor HOSTETTER

The work in industrial journalism and printing is designed to accomplish two purposes—the preparation of students in other fields to do occasional writing for newspapers and other periodicals on subjects of special interest; and the training of students fundamentally interested in journalism for positions on farm journals, newspapers and other publications, particularly where writing on agriculture and other industrial subjects is in demand. The instruction considers the requirements of newspapers, agricultural papers, trade publications, and general magazines, and the ethical problems of the profession of journalism. *The Kansas Industrialist,* the official paper of the College, is under the editorial and mechanical direction of the department. The office of *The Kansas State Collegian,* the student semiweekly newspaper, is in the department practice room. *The Brown Bull,* a humorous magazine which has aroused much favorable comment among newspaper men, is published by students in the department. Students write also for general newspapers, farm journals, and magazines.

Attention is given to the mechanical side of the profession in the instruction in printing, two semesters of which are required of all students taking the curriculum in industrial journalism. Printing has been taught in the institution continuously since 1873—the longest period during which instruction in the subject has been given in any American college.

The equipment for instruction in journalism and printing is that of a practical publishing and printing plant. This department owns equipment valued at $12,877.

A large amount of timely agricultural and other information is furnished regularly to Kansas newspapers, farm journals, and other publications. Special assignments are covered for these periodicals, and special inquiries are answered.

All students enrolled in the curriculum in industrial journalism and all students electing journalism practice or laboratory courses pay a laboratory charge of $1.50 a semester.

COURSES IN PRINTING

FOR UNDERGRADUATE CREDIT

101, 105. PRINCIPLES OF TYPOGRAPHY I AND II. 3(2-3) and 1(0-3), respectively; I and II, respectively. Mr. Amos.

I: The case, the point system, and the measurement of type and stock; the history of printing; development of the various typographic styles; practice in setting straight matter, with emphasis on accuracy.

II: Type faces and the typography of advertisements and head display; principles of effective make-up.

108, 111, 112. Ad. Composition I, II and III. 2(0-6) each; I, II, and III respectively. Prerequisites: For I, course 104; for II, course 108; for III, course 111. Mr. Keith and Mr. Amos.

I: Principles of display and design as applied to newspaper and magazine advertisements; practical work in setting ads. for magazines.

II and III: Course 108 continued; more complicated work studied.

114, 118, 120. Job Composition I, II and III. 2(0-6) each; I, II, and III, respectively. Prerequisites: For I, course 104; for II, course 114; and for III, course 118. Mr. Keith and Mr. Amos.

I: Emphasis on differences in requirements for job composition and ad. composition; proper selection of type faces, borders, and ornaments; setting jobs and locking them up for the pressroom.

II and III: Color work, tabular forms, and other complicated kinds of job work.

122, 126. Platen Press Work I and II. 2(0-6) each; I and II, respectively. Prerequisites: For I, course 108 or 114; for II, course 126. Mr. Keith and Mr. Amos.

I: Practical platen presswork under ordinary printing-office conditions; feeding of the press and preparation of the jobs by the student; selection of inks and care of printing rollers.

II: I continued with more advanced work in mixing inks and in color work.

131, 136. Cylinder Press Work I and II. 2(0-6) each; I and II respectively. Prerequisites: For I, course 126; for II, course 131. Mr. Keith and Mr. Amos.

I: The fundamentals for work on all kinds of cylinder presses; how to make the work ready and how to feed; the general care and handling of cylinder presses.

II: A continuation of Cylinder Presswork I.

COURSES IN INDUSTRIAL JOURNALISM

FOR UNDERGRADUATE CREDIT

151. Elementary Journalism. 2(2-0); I and SS. Mr. Charles and Miss Hostetter.

Methods of obtaining news of various types, the writing of the lead, and the general styles of the news story.

154, 155, 158, 159. Journalism Practice I, II, III and IV. 2(0-6) each; I, II, I and II, respectively. Prerequisites for each: All preceding journalism practice courses. Mr. Rogers, Mr. Brown, Mr. Charles and Miss Hostetter.

Laboratory practice in gathering news and writing and editing newspaper and magazine copy.

161. Industrial Writing. 2(2-0); I and II. Mr. Charles and Miss Hostetter.

Application of the principles of journalism to the treatment of industrial subjects, such as are found in agriculture, engineering, home economics, and more general scientific research.

167, 171. Industrial Feature Writing I and II. 2(2-0) each; I, II, and SS. respectively. Prerequisite: Industrial Writing. Mr. Rogers.

I: The feature article; its underlying principles applied to writing on agricultural and other industrial subjects; demands of newspapers, farm journals, and general magazines for writing of this character.

II: Agricultural journals, trade journals, and other publications of highly specialized character; actual writing for publications of these types and submission of material to editors; specialized work suited to women.

179. Principles of Advertising. 3(3-0); II. Prerequisite: For industrial

journalism students, course 161; for rural commerce students, Written and Oral Salesmanship. Mr. Keith.

Study of the goods to be advertised, analysis of the market, psychology of advertising, preparation of advertising copy, and other important matters; application of the principles involved.

182. The Rural Press. 3(3-0); I and II. Prerequisite: Course 151. Mr. Brown.

Nature and needs of the community newspaper, with emphasis on its presentation of the agriculture and rural life in its field; actual writing of news stories and items gathered on the campus for publication in Kansas community newspapers.

185. Supervised Observation and Teaching in Industrial Journalism. 2(2-0); II and SS. Mr. Brown.

The principles of newswriting, with practice; and intensive study of high school newspapers and yearbooks; financing the high-school newspaper and yearbook; staff organization.

FOR GRADUATE AND UNDERGRADUATE CREDIT

250. Advertising Practice. 2(2-0); I. Prerequisite: Course 179. Mr. Keith.

Practice in advertising writing, with special attention to copy and display problems; practical problems in the advertising of student activities and of local merchants; actual commercial work.

251A. Circulation and Advertising Promotion. 2(2-0); I. Prerequisite: Course 171. Mr. Keith.

Building up of circulation of periodical publications; soliciting of advertising; premiums and other plans for increasing circulation; the advertising agency, circulation analysis, and the fixing of advertising rates.

254. Copy Reading. 2(0-6); I. Prerequisite: Course 171. Mr. Brown, Mr. Charles and Miss Hostetter.

Practice in the work required of a copy reader, whether on a newspaper, an agricultural journal, or some other publication.

255. Contemporary Thought. 3(3-0); I. Prerequisite: Course 171 or equivalent. Mr. Brown.

Correlation and unification of various subjects previously pursued in college; unbiased presentation of contemporary developments and contemporary figures in science, the arts, and philosophy.

257. Editorial Practice. 2(2-0); II. Prerequisite: Copy Reading. Miss Hostetter.

The writing of editorials suitable for farm papers, trade papers, and newspapers; the shaping of editorial policies.

260. Ethics of Journalism. 2(2-0); II. Prerequisite: Course 251. Mr. Rogers.

The ethics of journalism as exemplified in the use of contributed matter, in the work of the reporter or staff writer, in the editorial conduct of the paper, and in the handling of circulation and advertising; federal and state laws relating to periodical publications, to advertising, to libel, and to author's rights.

265. Materials of Journalism. 2(2-0); I. Mr. Brown.

The principal newspapers and magazines; accuracy and adequacy of news reports and other published matter; materials handled by the publications; methods of treatment; character of editorial comment.

270. Magazine Features. 2(2-0); II and SS. Prerequisite: Permission of the instructor. Mr. Rogers and Mr. Brown.

The matter of the course is varied to suit the needs and desires of the students, emphasis being laid upon such types of magazine writing as members of the class wish to practice.

274. History of Journalism. 2(2-0); I. Prerequisite: One semester of college American History. Miss Hostetter.

The history of journalism from its beginning and the history of printing as far as this is concerned with periodical publications.

278. Journalism Surveys. 2(0-6); II. Mr. Rogers.

Careful investigation of the periodical reading matter of communities; tabulation of information obtained; relation of the reading matter to the industrial, economic, social and moral life of the communities.

282. Column Conducting. 2(2-0); II, when requested by a sufficient number. Mr. Davis, of the Department of English.

The conducting of the so-called column, humorous or semiserious; writing paragraphs, light verse, and similar material, with stress on practice in writing humor.

287. Current Periodicals. 3(3-0); II. Mr. Brown.

The material contained by current periodicals of various types, and the nature of its appeal to the reader.

FOR GRADUATE CREDIT

351. Research in Industrial Journalism. 2 to 5 credits: I and II. Mr. Rogers.

Several courses embodying creative literary work or detailed research in specialized journalism are arranged to meet the specific needs and desires of the individual graduate students.

Library Economics

Librarian Smith
Associate Librarian Derby
Reference Librarian Davis
Loan Librarian Camp
Reference Assistant Swenson
General Assistant Carter
Loan Assistant Irwin

The Library supplements the work of every department of the College. It is a storehouse of knowledge for every student. It supplies information and the latest results of scientific research for every instructor. The Library is thus essential to the College, forming, as it were, a center from which its various activities radiate.

In order that the Library may perform its functions with the highest degree of efficiency it is necessary that instruction be given regarding its use. With this thought in mind a course is offered the purpose of which is to familiarize the student with scientific, up-to-date methods in the use of books and to acquaint him with the best general reference books as well as with standard works on various subjects. Placed at the beginning of his College course it should tend to increase largely his efficiency in study throughout the entire course.

The books and pamphlets in the library are valued at $267,500; other equipment has a value of $33,178.

COURSES IN LIBRARY ECONOMICS

FOR UNDERGRADUATE CREDIT

101. Library Methods. 1(1-0); I and II. Miss Derby, Miss Davis, Miss Carter, Miss Camp, Miss Swenson, and Miss Irwin.

Classification and arrangement of books in the Library; card catalogues; the principal works of reference, such as dictionaries, encyclopedias, atlases, and standard works in history, literature, economics, quotations, statistics, etc.; public documents and their indexes; indexes to periodicals, etc.; methods of indexing current reading for purposes of future reference.

Mathematics

Professor Remick
Professor White
Professor Stratton
Associate Professor Hyde
Associate Professor Lewis
Associate Professor Lyons
Assistant Professor Janes
Assistant Professor Mossman
Instructor Holroyd
Instructor Eldridge
Instructor Porter
Instructor Stewart
Instructor Ross

In an institution that stands as an exponent of the industrial type of education, mathematics should occupy an important place. Training in the exact science is valuable not only for its own sake but also on account of its manifold applications. On this basis the courses in mathematics are offered primarily with the following ends in view: (1) The attainment of mental power and accuracy in the interest both of general culture and special application; (2) the acquirement of facts and processes that will provide the student with an indispensable tool for further scientific and technical study.

As several of the curricula of the College are formulated on the assumption that a half-year of solid geometry will have been taken in high school, classes in this subject are provided for students who are deficient in this respect. College credit on electives is allowed for this work.

The equipment owned by this department is valued at $713.

COURSES IN MATHEMATICS

FOR UNDERGRADUATE CREDIT

101. Plane Trigonometry. 3(3-0); I and II. Prerequisites: Plane geometry and one and one-half years of high-school algebra. Mr. Stratton, Miss Hyde, Mr. Lewis, Mr. Lyons, Miss Holroyd, Mr. Janes, Miss Mossman, Mr. Porter, and Miss Eldridge.

Functions of acute right triangles, goniometry, oblique triangles, practical problems. Text: Palmer and Leigh, *Plane and Spherical Trigonometry.*

102. Solid Geometry. 2(2-0); I and II. Prerequisites: Plane geometry and one year of high-school algebra. Mr. Lewis, Mr. Janes, Miss Holroyd, Mr. Porter, and Miss Eldridge.

Principal theorems, numerical exercises, and mensurational problems. Text: Smith, *Essentials of Plane and Solid Geometry.*

104. College Algebra. 3(3-0); I and II. Duplicates latter part of Math. 107. Prerequisites: Plane geometry and one and one-half years of high-school algebra. Mr. Stratton, Miss Hyde, Mr. Lewis, Mr. Lyons, Miss Holroyd, Mr. Janes, Miss Mossman, Mr. Porter and Miss Eldridge.

Elementary topics, functions and their graphs, and quadratic equations rapidly reviewed; complex numbers, theory of equations, permutations and combinations, partial fractions, logarithms, and determinants. Text: Hart, *College Algebra.*

107. College Algebra A. 5(5-0); II. Includes Math. 105. Prerequisite: Plane geometry and one year of high-school algebra. Mr. Stratton, Miss Hyde, Mr. Lewis, Mr. Lyons, Miss Holroyd, Mr. Janes, Miss Mossman, Mr. Porter and Miss Eldridge.

Brief review of elementary subjects; a thorough treatment of quadratics, ratio, proportion, progressions, and the binomial theorem for positive exponents; the chief content of course 104. Text: Hart, *College Algebra.*

110. Plane Analytical Geometry. 4(4-0); I. Prerequisites: Plane Trigonometry and College Algebra. Mr. White, Mr. Stratton, Miss Hyde, Mr. Lyons, Mr. Lewis, Mr. Janes, and Miss Mossman.

Coördinate systems, projections, loci, straight line, conics, parametric and empirical equations, with a discussion of the general equation of the second degree. Text: Roberts and Colpitts, *Analytical Geometry.*

119. Calculus. 3(3-0); I. Not open to students who have credit in Math. 205. Prerequisite: Plane Analytical Geometry. Mr. Remick, Mr. Stratton, and Mr. Lyon.

Brief treatment of the fundamental principles of both branches of calculus; practice with the standard formulas of differentiation and their application to geometry and mechanics; integration of the usual elementary forms; the idea of the definite integral and a few of the more important applications.

122. Special Methods in the Teaching of Mathematics. 3(3-0); II. Miss Hyde.

Best methods of teaching arithmetic, algebra, and geometry; the reports of prominent mathematical organizations, especially those of the international commission; comparison of the curricula of different schools; an examination of books and articles on the teaching of mathematics; emphasis on pedagogical questions, with some reference to the historical development of elementary mathematics.

123. Special Methods in Arithmetic. 2(2-0); SS. Miss Holroyd.

Best methods of presenting the various topics; use of standardized and practice tests; supplementary work; best method of adapting the state test to the minds of the pupils, etc. Text: Thorndyke, *The New Methods in Arithmetic.*

126. Elements of Statistics. 3(3-0); I. Not open to students having credit in Educ. 223. Mr. White.

The parts of algebra most needed as a basis for statistical work; development of the elementary principles used in analysis of statistical data.

129. Survey Course in Mathematics. 3(3-0); II. Prerequisites: Trigonometry and College Algebra. Mr. Stratton.

A general culture course designed to give an insight into the nature and function of mathematics beyond the elementary field. Essential ideas of analytical geometry and calculus with applications.

131. Institutional Accounting. 3(3-0): II. Duplicates in part Math. 137A. Mr. Stewart and Mr. Ross.

Preparation for publication of statements of income and expenditure, balance sheets, treasurer's reports, financial data and statistics, and the annual returns of net income required under the federal income-tax law; the mathematics of investment, the handling of endowment and trust funds and the preparation of budgets.

137A. Accounting. 3(2-3); II. Duplicates in part Math. 131. Mr. Stewart and Mr. Ross.

An introduction to accounting adapted for students who have had little or no bookkeeping. Text: McKinsey, *Bookkeeping and Accounting,* Vol. I.

140A, 143A. Accounting Practice I and II. 3(2-3) each; I and II, respectively. Prerequisites: For I, Accounting, or one year of high-school bookkeeping; for II, course 140A. Mr. Stewart and Mr. Ross.

I: A study of the principles and structure of accounts designed to give power to analyze commercial accounts and statements; problems and practice sets used as an application of principles to practice. Text: Paton, *Accounting.*

II: Partnership and corporation accounting of problems peculiar to them; valuation of balance-sheet items with special reference to depreciation, inventories, and intangibles; and several other topics. Text: Kester, *Accounting Theory and Practice,* Vol. I.

146. Income-tax Accounting. 2(2-0); I. Prerequisite: Course 143A. Mr. Stewart.

Preparation of federal income-tax returns, with study of the revenue act. Text: Government Bulletin, *Regulations 69,* relating to the income tax.

148. Accounting Systems. 3(3-0); II. Prerequisite: Course 143A. Mr. Ross.

Accounting systems used in various types of business enterprises, such as building and loan associations, life and fire insurance companies, banks, stock brokerage houses, department stores, public utilities, and municipalities.

150. Mathematics of Investment. 3(3-0); II. Prerequisite: Course 143A. Mr. Stewart.

Calculation of compound interest; annuities, methods of measuring depreciation, and determination of the price at which bonds should be bought to yield a market rate of interest; amortization of premiums and accumulation of discount on bonds; life insurance actuarial problems. Texts: Lovitt and Holtzclaw, *Mathematics of Business;* Glover, *Tables of Applied Mathematics,* Parts I and IV.

153. Auditing. 3(2-3); I. Prerequisite: Course 143A. Mr. Stewart and Mr. Ross.

Auditing records of commercial enterprises; attention to balance sheet and detail audits with study of both principles and practices. A practical audit problem required.

156, 160. Advanced Accounting I and II. 3(3-0) each; II each, alternating. Prerequisite: Course 143A. Mr. Stewart and Mr. Ross.

I: Federal income tax, with practice in the preparation of personal and corporation income-tax returns; accounting systems used in various types of business enterprises. Text: Finney, *Principles of Accounting,* Vol. I.

II: The advanced theory of accounts, solution of problems selected largely from certified public accountant examinations in the various states. Text: Kester, *Accounting Theory and Practice,* Vol. II.

FOR GRADUATE AND UNDERGRADUATE CREDIT

The following courses are available on request by a sufficient number of students. Numbers 201, 203, 205, 206, 210, 213, and 216 are offered each year.

201. Differential Equations. 3(3-0); I. Prerequisite: Calculus II. Mr. Remick.

The various standard types of differential equations, with the usual applications. Text: Cohen, *Differential Equations.*

203. Theory of Statistics. 3(3-0); II. Prerequisite: Elements of Statistics, or equivalent. Mr. White.

The theory of probability applied to statistical problems; statistical curves, correlation theory, curve fitting, and problems of rambling sampling; actual practice with data from biology, agronomy, physics, etc.

204. Method of Least Squares and Theory of Measurement. 2(2-0); II. Prerequisite: Calculus II. Mr. Remick and Mr. White.

The law of errors based on the theory of probability and the probability curve; adjustment of observations by the method of least squares, development of precision measures; distribution of errors; and Gauss' method of substitution in the solution of normal equations.

205. Calculus I. 5(5-0); II. Open for only two hours credit to students who have credit in Math. 119. Prerequisite: Plane Analytical Geometry. Mr. Remick, Mr. White, Mr. Stratton, Mr. Lyons, Mr. Lewis, Mr. Janes, and Miss Hyde.

The usual topics of differential calculus, with integration of standard forms, definite integrals, rational fractions, and integration by parts. Text: Love, *Differential and Integral Calculus.*

206. Calculus II. 3(3-0); I. Prerequisite: Calculus I. Mr. Remick, Mr. White, Mr. Stratton, Mr. Lyons, Mr. Lewis, and Miss Hyde.

Problems involving areas, lengths surfaces and volumes treated by processes of single integration; idea of successive and partial integration applied to areas, moments, centers of gravity, surfaces, volumes, etc.; types of differ-

ential equations most frequently met subsequently by the student of engineering. Text: Love, *Differential and Integral Calculus.*

207. Solid Analytical Geometry. 3(3-0); II. Prerequisites: Courses 110 and 206. Mr. White.

Coördinates of points in space and their transformation involving discussion of lines and planes; standard types of quadratic surfaces, their classification and principal properties. Text: Snyder and Sisam, *Analytical Geometry of Space.*

210. Advanced Calculus I. 3(3-0); I. Prerequisite: Calculus II. Mr. White and Mr. Lyons.

Special topics in integral calculus, including various methods of integrating elementary forms, definite integrals with attention to gamma and beta functions, and applications to lengths and areas. Text: Osgood, *Advanced Calculus.*

213. Advanced Calculus II. 3(3-0); II. Prerequisite: Course 210. Mr. White and Mr. Lyons.

Continuation of course 210, including further application to geometry and mechanics, a treatment of line, surface, and space integrals, and a discussion of elliptic integrals. Text: Osgood, *Advanced Calculus.*

216. Theory of Equations. 3(3-0); I. Prerequisite: Calculus II. Mr. Remick.

The elements of the classical theory including the general cubic and quartic equation and the complete solution of numerical equations; discussion of symmetric functions, resultants, and discriminants. Text: Dickson, *First Course in the Theory of Equations.*

FOR GRADUATE CREDIT

The following courses are available by appointment:

301. Theory of Functions of a Complex Variable. 3(3-0); II. Prerequisites: Advanced Calculus II and Differential Equations. Mr. Remick.

An introductory course with the usual line of topics.

306. Theoretical Mechanics. 3(3-0); I. Prerequisite: Calculus II. Mr. Stratton.

Mechanics in its relation to mathematical analysis.

311. Projective Geometry. 3(3-0); II. Prerequisite: Course 110. Mr. White.

The fundamental forms, projective relations, point rows, and pencils of the second order, poles and polars, properties of conics and involution.

316. Advanced Differential Equations. 3(3-0); I. Prerequisite: Course 201. Mr. Remick.

Treatment of special topics, such as the equations of Legendre, Bessel, and Ricatti, with applications.

321. Lie Theory of Differential Equations. 3(3-0); II. Prerequisite: Course 201. Mr. Remick.

Lie's theory of one-parameter groups, with special reference to its application to the solution of the various types of differential equations.

326. Calculus of Variation. 3(3-0); I. Prerequisite: Course 201. Mr. Remick.

Some of the standard problems of maxima and minima wherein a definite integral affords the fundamental form of expression.

331. Mathematical Research. Credit and hours of work arranged in consultation with the head of the department; I and II. Required of all candidates for the master's degree whose major work is in the Department of Mathematics.

Military Science and Tactics

Professor PETTY, Lt. Col. Inf., U. S. A.
Associate Professor PEIRCE, Maj. C. A. C., U. S. A.
Associate Professor BOWEN, Capt. Inf., U. S. A.
Assistant Professor WERTZ, Capt. C. A. C., U. S. A.
Assistant Professor STEWART, Capt. C. A. C., U. S. A.
Assistant Professor WALTZ, Capt. Inf., U. S. A.
Assistant Professor FITZGERALD, Capt. V. C., U. S. A.
Assistant Professor MCGARRAUGH, Capt. C. A. C., U. S. A.
Assistant Professor SIMS, First Lieut. Inf., U. S. A.
Military Property Custodian CLAEREN, Maj. O. R. C.
Instructor COFFEE, First Serg. C. A. C., U. S. A.
Instructor CONNOLLY, Staff Serg. Cav., U. S. A.
Instructor PUGH, Serg. Inf., U. S. A.
Instructor WILSON, Serg. C. A. C., U. S. A.

Since this College is one of the beneficiaries of the act of congress of 1862, military tactics is required in the College curricula. All young men of age, not physically disqualified, are required to take military training four full hours a week for two years. A student entering as a junior or above is required to take military science for the time necessary to complete the remainder of his College course unless this period is reduced by military credits accepted from another institution.

Students enrolling in military courses who were members of junior units, R. O. T. C., at military academies or high schools, or those receiving military training while enrolled in government-aided schools (section 55c, national defense act, and section 1225, Revised Statutes) may apply for advanced credit examinations on the basis of one semester for each semester of training at a high school or government-aided school; provided there is stationed at these schools a regular officer of the United States Army; and provided further, that no credit will be given beyond the basic course, which comprises the first four semesters of the College (freshman and sophomore years). (See "Advanced Credits.")

Requests for excuse from military science, or for postponement of the work, are acted upon by the president of the College. Such requests are presented through the student's dean, and the president obtains the advice of the professor of military science and tactics, who thoroughly investigates each case on its merits and makes his recommendation to the president. Requests based on physical condition must be accompanied by a recommendation made by the College physician. Students excused from military science for any reason are assigned to an equivalent amount of some other College work instead. Students permitted to postpone military science are not thereby excused, but must make it up later.

The act of congress of June 3, 1916, known as the national defense act, provides for the establishment in civil institutions of a Reserve Officers' Training Corps (R. O. T. C.).

The object of this provision is stated as follows:

"The primary object of establishing units of the Reserve Officers' Training Corps is to qualify, by systematic and standard methods of training, students at civil institutions for reserve officers. The system of instruction, herein prescribed, presents to these students a standard measure of that military training which is necessary in order to prepare them to perform intelligently the duties of commissioned officers in the military forces of the United States, and it enables them to be thus trained with the least practicable interference with their civil careers.

"Units of the senior division may be organized at civil institutions which require four years of collegiate study for a degree, including state universities and those state institutions that are required to provide instruction in military tactics under the provisions of the act of congress approved July 2, 1862, donating lands for the establishment of colleges where the leading object shall be practical instruction in agriculture and the mechanic arts, including military tactics.

"Units of the junior division may be organized at any other public or private educational institution."

An infantry unit, a coast artillery unit, and a veterinary unit of the Reserve Officers' Training Corps have been established in this College.

Members of the R. O. T. C. will receive the benefits mentioned below:

1. Senior Division, Basic Course (freshmen, sophomores). Each student of these classes will be furnished with complete uniform, and equipment for his use during the course. The articles remain the property of the United States and must be accounted for and turned in by each student at the close of each college year or upon withdrawal from the R. O. T. C. Shoes are not furnished. Each student will provide himself with a pair of high tan shoes, not laced boots, before entering College, as they will be required immediately upon his admission.

A laboratory fee of 35 cents per semester is charged all students assigned to military training.

Corporals are selected from sophomores and specially qualified freshmen.

2. Senior Division, Advanced Course (students who have completed the two years' Basic Course). The student who continues in the R. O. T. C. after completing the Basic Course will receive the following benefits:

He will receive a special uniform allowance.

He will receive commutation of subsistence at the rate of 30 cents per day, provided he executes an agreement to complete the Advanced Course, or continue in the course during the remainder of his time in College, and to take the course in camp training during such period as prescribed by the Secretary of War. The camps referred to involve no expense on the part of the student. In addition, a complete summer uniform will be issued and he will be paid at the rate of 70 cents per day for not to exceed six weeks, and five cents per mile to and from camp to cover travel expenses.

After graduation he will be eligible for appointment by the President of the United States as a reserve officer of the army, and if so appointed he may, under certain conditions, be appointed and commissioned a second lieutenant in the regular army with pay at the rate of $125 per month, with the usual allowances. (Ration allowance is $18 and allowance for quarters, $40 per month.)

In order to elect the Advanced Course, R. O. T. C., a student must have the recommendation of the president of the College, his dean, and the professor of military science and tactics.

The corps of cadets at present is organized as one regiment. A military band is also provided for, the members of which must be thoroughly trained in military tactics. Assignments to the military band are made upon recommendation of the bandmaster, who has charge of the technical instruction.

Officers and higher noncommissioned officers are selected from the students taking the Advanced Course, R. O. T. C., according to class standing. This selection is made from among those cadets who have been most studious and soldierlike in the performance of their duties, and the most exemplary in their general deportment.

Students who are regularly enrolled in the Advanced Course of the Senior Division normally receive three semester credits of elective work toward graduation for each semester of military training taken beyond the Basic Course.

This department possesses equipment valued at $3,234. In addition, the department is the custodian of federal government equipment valued at $300,000.

COURSE IN MILITARY SCIENCE AND TACTICS

FOR UNDERGRADUATE CREDIT

Senior Division R. O. T. C.

BASIC COURSES, INFANTRY

101. INFANTRY I. 1½(0-4); I. Lieut. Sims.

(*a*) *Practical.* Physical drill, infantry drill.

(*b*) *Theoretical.* Military courtesy, national defense policy, infantry drill.

102. INFANTRY II. 1½(0-4); II. Prerequisite: Course 101. Lieut. Sims.

(*a*) *Practical.* Infantry drill, rifle marksmanship.

(*b*) *Theoretical.* Rifle marksmanship, military courtesy and customs; military hygiene, first aid.

103. INFANTRY III. 1½(0-4); I. Prerequisite: Course 102. Capt. Rose.

(*a*) *Practical.* Acting as instructors of freshmen in infantry drill and musketry problems.

(*b*) *Theoretical.* Infantry drill regulations, weapons of the infantry platoon.

104. INFANTRY IV. 1½(0-4); II. Prerequisite: Course 103. Capt. Rose.

(*a*) *Practical.* Infantry platoon problems, musketry, scouting and patrolling, infantry weapons, demonstration of their uses and mechanisms, practice in command and leadership.

(*b*) *Theoretical.* Study of infantry weapons, interior guard duty, musketry, scouting and patrolling.

ADVANCED COURSES, INFANTRY

109. INFANTRY V. 3(2-3); I. Prerequisite: Infantry IV. Capt. Waltz.

(*a*) *Practical.* Leadership and instruction in all basic course subjects.

(*b*) *Theoretical.* Field engineering, tactics, and machine gun.

110. INFANTRY VI. 3(2-3); II. Prerequisite: Infantry V. Capt. Waltz.

(*a*) *Practical.* Machine gun, sketching, and map reading.

(*b*) *Theoretical.* Machine gun and sketching.

111. INFANTRY VII. 3(2-3); I. Prerequisite: Infantry VI. Capt. Bowen.

(*a*) *Practical.* Command and leadership, basic course subjects.

(*b*) *Theoretical.* Military law, administration and organization, and combat principles.

112. INFANTRY VIII. 3(2-3); II. Prerequisite: Infantry VII. Capt. Bowen.

(*a*) *Practical.* Command and leadership, basic course subjects, tactical problems.

(*b*) *Theoretical.* Military tactics, practical problems, 37-mm. gun, 3-inch trench mortar, military history, rules of land warfare.

BASIC COURSE, COAST ARTILLERY

(For students of the Division of Engineering only.)

113. ARTILLERY I. 1½(0-4); I. Capt. McGarraugh.

(*a*) *Practical.* Physical drill, infantry drill.

(*b*) *Theoretical.* Close order infantry drill to include the company, military courtesy, and customs of the service.

NOTE.—Advanced-course students are required to attend one camp. This comes normally at the end of the junior year, and is held normally at Fort Leavenworth, Kan.

114. ARTILLERY II. 1½(0-4); II. Prerequisite: Artillery I or Infantry I. Capt. McGarraugh.

(*a*) *Practical.* Close-order infantry drill, parades, rifle marksmanship, and preliminary artillery instruction.

(*b*) *Theoretical.* Rifle marksmanship, military hygiene, first aid, and military policy.

115. ARTILLERY III. 1½(0-4); I. Prerequisite: Artillery II or Infantry II. Capt. Wertz.

(*a*) *Practical.* Infantry instruction; seacoast, heavy and antiaircraft artillery.

(*b*) *Theoretical.* Antiaircraft artillery, cordage and mechanical maneuvers, telephones, identification of aircraft, and infantry ceremonies.

116. ARTILLERY IV. 1½(0-4); II. Prerequisite: Artillery III. Capt. Wertz.

(*a*) *Practical.* Section (*a*) of course 115 continued.

(*b*) *Theoretical.* Range finding for fixed guns, artillery matériel, warships.

ADVANCED COURSES, COAST ARTILLERY

(For students of the Division of Engineering only.)

117. ARTILLERY V. 3(2-3); I. Prerequisites: Artillery IV and Plane Trigonometry. Capt. Stewart.

(*a*) *Practical.* Duties as cadet officers and noncommissioned officers in connection with courses 113 to 116, artillery matériel, orientation.

(*b*) *Theoretical.* Gunnery, artillery matériel, topography, and orientation.

118. ARTILLERY VI. 3(2-3); II. Prerequisites: Artillery V and Plane Trigonometry. Capt. Stewart.

(*a*) *Practical.* Section (*a*) of course 117 continued.

(*b*) *Theoretical.* Gunnery for heavy and antiaircraft artillery.

119. ARTILLERY VII. 3(2-3); I. Prerequisite: Artillery VI. Major Peirce.

(*a*) *Practical.* Duties as cadet officers and noncommissioned officers; artillery matériel, motor transportation, command and leadership.

(*b*) *Theoretical.* Military law, motor transportation.

120. ARTILLERY VIII. 3(2-3); II. Prerequisite: Artillery VII. Major Peirce.

(*a*) *Practical.* Section (*a*) of course 119; gunnery.

(*b*) *Theoretical.* Tactical employment of artillery, field engineering, and administration.

NOTE.—Advanced-course students are required to attend one camp. This comes normally at the end of the junior year and is held normally at Camp Knox, Ky.

BASIC COURSES, VETERINARY CORPS

(For students in the Division of Veterinary Medicine only.)

121. MILITARY SCIENCE (VET.) I. 1½(0-4); I. Capt. FitzGerald.

(*a*) *Practical.* Same as course 101 (Infantry I).

(*b*) *Theoretical.* Organization and policies of the U. S. Army, military art.

122. MILITARY SCIENCE (VET.) II. 1½(0-4); II. Prerequisite: Course 121. Capt. FitzGerald.

(*a*) *Practical.* Same as course 102 (Infantry II).

(*b*) *Theoretical.* Organization and administration, sanitation, logistics, first aid.

123. MILITARY SCIENCE (VET.) III. 1½(0-4); I. Prerequisite: Course 122. Capt. FitzGerald.

(*a*) *Practical.* Same as section (*a*) of course 102; duties of privates and noncommissioned officers of the veterinary corps demonstrated.

(*b*) *Theoretical.* Tactics, logistics.

124. Military Science (Vet.) IV. 1½(0-4); II. Prerequisite: Course 123. Capt. FitzGerald.

(*a*) *Practical.* Same as courses 102 (Infantry) and 123.

(*b*) *Theoretical.* Organization and administration; sanitation; military art; logistics, first aid.

ADVANCED COURSES, VETERINARY CORPS

(For students in the Division of Veterinary Medicine only.)

129A. Military Science (Vet.) V. 1(1-0); I. Prerequisite: Course 124. Capt. FitzGerald.

(*a*) *Practical.* Duties of junior officers demonstrated.

(*b*) *Theoretical.* Organization and administration, sanitation, and animal management.

130A. Military Science (Vet.) VI. 1(1-0); II. Prerequisite: Course 129. Capt. FitzGerald.

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Sanitation, including inspection of meat and food products.

131A. Military Science (Vet.) VII. 1(1-0); I. Prerequisite: Course 130. Capt. FitzGerald.

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Hospitals, hospitalization, and sanitation.

132A. Military Science (Vet.) VIII. 1(1-0); II. Prerequisite: Course 131. Capt. FitzGerald.

(*a*) *Practical.* Continuation of (*a*), section 129.

(*b*) *Theoretical.* Communicable diseases, foreign inspection, organization and administration (continued), résumé of entire course.

Note.—Advanced-course students are required to attend one camp. This comes normally at the end of the junior year, and is held normally at Fort Snelling, Minn.

Modern Languages

Professor Cortelyou
Professor Limper
Assistant Professor Willmann
Assistant Professor Crittenden
Instructor Pettis

The study of modern foreign languages serves a number of purposes. It gives the student general training and culture; it throws helpful side lights upon English, his mother tongue; and it gives him important aid in scientific research. It is desired that the instruction in modern languages here given be as practical as possible, without, however, failing to encourage an appreciation of modern foreign literature. The plan of instruction in general is a combination of the grammatical and conversational methods, each of which has its own special advantages.

A number of literary and scientific periodicals published in French, Spanish, and German are received by the College Library, and afford the student excellent opportunity to amplify his reading knowledge of these languages.

Students who have had French, Spanish, or German in high school are required, as a rule, to take more advanced courses as their elective or required work in that language. Those who have had one year of a foreign language in high school should be assigned to the second course here; those who have had two years in high school should consult the head of the department regarding assignment to advanced work here.

The department equipment is valued at $578.

COURSES IN GERMAN

FOR UNDERGRADUATE CREDIT

101, 102. GERMAN I AND II. 3(3-0) each; I and II each. Prerequisite: For II, I or equivalent. Dr. Cortelyou and Mr. Limper.

Introductory courses; grammar completed. Text: Vos, *Essentials of German.*

111. GERMAN READINGS. 3(3-0); I. Prerequisite: German II or equivalent. Dr. Cortelyou and Mr. Limper.

Readings of fairly easy, idiomatic selections from modern authors; grammatical drill; German conversation based on the text read. Text: Bierwirth and Herrick, *Aehrenlese.*

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. GERMAN SHORT STORIES. 3(3-0); II, when requested by a sufficient number. Dr. Cortelyou and Mr. Limper.

Interesting short stories by modern authors.

206. GERMAN COMEDIES. 3(3-0); II. Prerequisites: German Readings. Dr. Cortelyou and Mr. Limper.

Recent one-act comedies of literary merit and of a realistic, lively, and cleanly humorous nature; conversation and composition based on the text. Text: Manley and Allen, *Four German Comedies.*

226. GERMAN CLASSICS. 3(3-0); I, when requested by a sufficient number. Dr. Cortelyou.

An introduction to the German classics. Texts: Lessing, *Minna von Barnhelm,* ed. by von Minckwitz and Wilder; and Goethe, *Herman und Dorothea,* ed. by Allen.

231. GERMAN PROSE. 3(3-0); I, when requested by a sufficient number. Prerequisite: Course 201 or 206. Dr. Cortelyou.

Designed to give facility in rapid translation of fairly easy prose; prepared translations and sight translations. Text: Allen and Batt, *Easy German Stories,* Vols. I and II.

237. SCIENTIFIC GERMAN I. 4(4-0); I. Prerequisite: German II. Dr. Cortelyou.

An introduction to the vast field of scientific publications appearing in German; miscellaneous scientific articles, especially those dealing with chemistry and physics. Text: Wright, *German Science Reader.*

COURSES IN FRENCH

FOR UNDERGRADUATE CREDIT

151, 152. FRENCH I AND II. 3(3-0) each; I, II, and SS, each. Prerequisites: For II, I or one year of high-school French. Mr. Limper and Miss Pettis.

The fundamentals of French grammar; reading and conversation. Text: Fraser and Squair, *Complete French Grammar.*

161. FRENCH READINGS. 3(3-0); I and SS. Prerequisite: French II or equivalent. Mr. Limper and Miss Pettis.

Primarily a reading course; grammar reviewed; conversation. Texts: Labiche et Martin, *Le Voyage de Monsieur Perrichon;* Hugo, *Les Miserables;* and Sands, *La Mare au Diable.*

FOR GRADUATE AND UNDERGRADUATE CREDIT

251. FRENCH SHORT STORIES. 3(3-0); I and II. Prerequisite: French Readings or two years of high-school French. Mr. Limper and Miss Pettis.

Modern short stories by such writers as Daudet, Maupassant, and Zola. Text: Buffum, *French Short Stories.*

256. The French Drama. 3(3-0); II. Prerequisite: 12 hours of college French or equivalent. Mr. Limper.

Some outstanding plays of Moliére, Corneille, Beaumarchais, Labiche et Martin, and Hervieu; their place in French drama.

261. French Composition and Conversation. 3(3-0); II, when requested by a sufficient number. Prerequisite: 12 hours college French, or equivalent. Mr. Limper.

Class period devoted to practice in speaking French; written themes required as preparation for each recitation.

270. Teachers' Course in French. 3(3-0); when requested by a sufficient number. For prerequisites, consult instructor. Mr. Limper.

Anatomical basis for production of sounds peculiar to French; methods of presenting grammar; thorough grammar review; careful examination of the French reading texts used in Kansas; methods of conducting a *cercle français,* and material to be used in it.

COURSES IN SPANISH

FOR UNDERGRADUATE CREDIT

176, 177. Spanish I and II. 3(3-0) each; I, II, and SS, each. Prerequisite: For II, I or one year of high school Spanish. Miss Willmann and Miss Crittenden.

The fundamentals of Spanish grammar, stress on training to understand spoken Spanish. Texts: Hills and Ford, *First Spanish Course* (for I and II); Weems, *Un verano en España* (for II).

180. Spanish Readings. 3(3-0); I, II, and SS. Prerequisite: Spanish II, or equivalent. Miss Willmann and Miss Crittenden.

One or two of the best modern Spanish books. Texts: Alarcón, *El final de Norma;* El Padre Isla, Lesage, *Gil Blas;* and Martinez Sierra, *Sueño de una noche de agosto.*

195A. Spanish Conversation. 3(3-0); I. Prerequisite: Spanish Readings or equivalent. Miss Willmann and Miss Crittenden.

Purpose, to develop an ability to speak Spanish and to understand the spoken language. Texts: Various books, magazines and papers.

FOR GRADUATE AND UNDERGRADUATE CREDIT

272. Spanish Short Stories. 3(3-0); II. Prerequisite: Spanish Readings. Miss Willmann and Miss Crittenden.

Stories from the most eminent of modern Spanish authors, such as Béquer, Trueba, Alarcón, Valdés, and Ibañez. Text: Hills and Reinhardt, *Spanish Short Stories.*

275. The Spanish Novel. 3(3-0); I. Prerequisite: Course 272 or equivalent. Miss Willmann and Miss Crittenden.

A panoramic view of the Spanish novel in the several periods of Spanish literary production.

280. The Spanish Drama. 3(3-0); II. Prerequisite: Course 272 or equivalent. Miss Willmann and Miss Crittenden.

A general view of the drama produced in Spain's best literary periods.

Music

Professor Lindquist
Associate Professor Lamont
Associate Professor Elsie Smith
Assistant Professor Gordon
Assistant Professor Hartman
Assistant Professor Painter
Assistant Professor Sayre
Assistant Professor Jefferson
Instructor Irma Smith
Instructor Schobel
Instructor Farrar
Instructor Grossman
Instructor Jackson
Instructor Stratton
Instructor Steel

To be a vital factor in the life of every student is the aim of the Department of Music. It strives to create and foster a love for and an appreciation of the best in music, and to give to students that broader culture and more complete education which is gained through academic, professional and vocational training combined with musical and artistic study. Believing that this can be accomplished to a much greater degree by having a teaching staff of musicians who are not only capable instructors but also artistic performers, courses are offered which will prepare the student not only for the teaching profession, but for an artistic career as well. Students enrolled in the department participate in the musical contributions to the public programs of the College and such participation is a part of their training and study. The Department of Music is provided with equipment valued at $22,207.

METHODS OF INSTRUCTION

Instruction in voice and instrumental music is given in private lessons. No two students have the same mental, physical or artistic capacity, and their individual capabilities can be neither properly nor fully developed without painstaking personal attention. The best results are dependent on a close adaptation to the individual needs of the pupils, and this, of course, cannot be gained in classes, as is the case in the individual lessons. The effectiveness of the methods used is demonstrated by the interest and progress of the pupils.

All theoretical work is taught in classes. These and some other classes in the Department of Music are free to any student in the institution.

CREDITS

Students taking work in the Department of Music to a sufficient extent are allowed credits on their electives in the Divisions of General Science, Home Economics, and Agriculture, while substitutions in Music, with the approval of the dean, may be made in the Division of Engineering, as follows: For Voice or some instrument, two hours each semester; for History and Appreciation of Music, three hours each semester; for Harmony, two hours each semester; for Counterpoint, two hours each semester; for Musical Form and Analysis; two hours each semester; for Orchestra or Band, one hour each semester; for Public-school Music Methods, two hours each semester. Any student having a full assignment may, upon recommendation of the director of music together with the approval of the student's dean, take music without credit.

Students coming from other schools to enter our courses in music may be sufficiently advanced as players or singers to enter the second or third year of the regular music curricula but prohibited therefrom owing to their lack of knowledge of theory. If such students enter the first year of the theoretical course, their progress as players and singers is not retarded, but it would be much to their advantage to make special theoretical preparation in the hope of qualifying for more advanced standing.

Applicants for freshman standing in the four-year music curricula must pass an examination over certain required work. Examinations also will be held at the close of each year before advanced standing is allowed. A list of this examination material may be had by writing the director of the Department of Music.

PRELIMINARY PIANO TRAINING

Preliminary training in piano is undertaken by two classes of students. The first class consists of College students not able to meet the College entrance requirements in piano, and of high-school students. The second consists of children who take one hour of class work each week, supplementing private lessons.

Special training is given in rhythm, sight reading, scale building, melody writing, ear training, and appreciation. This work aims to develop in the student a natural means of expression through music and to furnish the right foundation for a musical education.

AUXILIARY PIANO TRAINING

Attendance at a one-hour auxiliary class alternate weeks is required of all students majoring in piano. Frequent opportunity for playing is given here and a study is made of musical terminology and the development of piano literature.

THEORETICAL COURSES IN MUSIC

The aim of theoretical courses is to give the student an intelligent conception of music through the study of its historical development and scientific construction.

FOR UNDERGRADUATE CREDIT

101, 102. Harmony I and II. 2(2-0) each; I and II, respectively. Prerequisite: Music Fundamentals or equivalent. Mr. Sayre and Mr. Stratton.

I: Review of the major and minor scales, intervals, construction and progression of the primary triads and their inversions; the dominant seventh and its progressions and inversions, harmonizing melodies and basses; original work and elementary instrumentation.

II: Subordinate triads and their sevenths in progressions and inversions; the beginnings of modulation; writing of original exercises.

103, 104. Harmony III and IV. 2(2-0) each; I and II, respectively. Prerequisite: Harmony II. Miss Jefferson.

I: Modulation completed; altered and mixed chords; embellishments.

II: Works of the masters; writing of original exercises and small compositions.

105, 106, 107, 108. Ear Training and Sight Singing I, II, III, and IV. 2(2-0) each, but no credit outside the music curricula; I, II, I and II, respectively. Prerequisite: Music Fundamentals or equivalent. Miss Hartman.

The reading and hearing of intervals, chords, and rhythmical forms.

108A. Counterpoint. 2(2-0); I and II. Prerequisite: Harmony IV. Mr. Gordon.

A study of melody writing, the association of melodies in simple counterpoint, leading to the writing of original two- and three-part inventions.

109. Musical Form and Analysis. 2(2-0); I and II. Prerequisites: Harmony IV and Counterpoint. Mr. Gordon.

The various forms used in composition; the music of Bach, Haydn, Beethoven, Schumann, Chopin and others.

110. Survey of Public-school Music. 2(2-0); II. Miss Hartman.

A general résumé of the four years' work in public-school music methods and materials, designed to give the student such data as will enable him to understand the relationship of his specialized work to the public-school music system.

112, 113. History and Appreciation of Music I and II. 3(3-0) each; I and II, respectively. Mr. Lamont.

Aim of this course: To give definite knowledge of each of the musical

periods, the style of music peculiar to each and contact with the great personalities in music.

114. History and Appreciation of Music. 3(3-0); SS.
A condensation of courses 112 and 113.

117. Conducting I. 1(1-0); I and II. Mr. Lamont.
Practical training in essentials of good conducting, including the correct method of indicating all forms of rhythm, the seating arrangements of bands, orchestras, and choruses, and a practical illustration of the use of this information in the various ensemble organizations of the College.

118. Vocal Composition. 2(1-0), six hours of preparation, II. Prerequisites: Harmony I to IV. Mr. Gordon.
Comprehensive study of rhythm and tone color in poetry; writing of original musical settings for the different poetic forms; composition of vocal solos, duets, trios, and quartets, both with and without piano accompaniment.

119. Instrumental Composition. 2(1-0), six hours of preparation; II. Prerequisites: Harmony I to IV, and Counterpoint. Mr. Gordon.
Advanced study in composition; writing of music for all instruments, both in solo and ensemble.

120, 121. Public-school Music I and II. 2(2-0) each; I and II, respectively. Prerequisite: Understanding of musical notation and the piano keyboard. Miss Hartman.
Given for the training of teachers of music in the public schools. These courses cover work for primary and intermediate grades and meet requirements of the state of Kansas for such training.

122 to 127. Public-school Music III to VIII. 2(2-0) each; I, II, I, II, I and II, respectively. Miss Hartman.
Courses 120 and 121 continued. III and IV cover work for the upper grammar grades and junior high school. V consists of a comparison of methods for all grades. VI consists of discussion and practice in teaching materials suitable for junior high school. VII and VIII consist of methods and practice of teaching in senior high school.
Students in the above courses are expected to do one semester of practice teaching of music in the grade schools of Manhattan under the supervision of Miss Hartman, and to observe such additional music work in the high schools as may be possible.

128. Conducting II. 1(1-0); I and II; given only when requested by a sufficient number. Prerequisites: Harmony I to IV, and Conducting I. Mr. Lamont.
A continuation of Conducting I, course 117.

129. Conducting III. 1(1-0); I, by appointment. Prerequisite: Conducting II. Mr. Lamont.
This course is a continuation of course 128.

130. Instrumentation. 2(2-0); I. Prerequisite: Harmony II. Mr. Gordon.
All band and orchestra instruments studied with relation to their character, range, and function; simple and familiar compositions scored for string trio, quartet, and quintet, and for wind quartet and sextet.

133. Orchestration. 2(2-0); II. Prerequisites: Harmony I to IV, and Counterpoint. Mr. Gordon.
Writing of music for orchestra and band studied; analytic and synthetic study of music scores.

135. Practice Conducting. 1(½-2); II. Prerequisite: Conducting III. Mr. Lamont.
A special ensemble group is trained by the student in some work he has

prepared in the course in orchestration. This problem is then presented in public.

137A to 137H. Instrument I to VIII. 3(1-9) each for course I to V, 2(1-6) each for VI and VII, and 1(½-6) for VIII; I (courses I, III, V, and VII) and II (courses II, IV, VI, and VIII). Mr. Lamont, Mr. Gordon, and assistants.

These courses are offered exclusively to students taking the curriculum in public-school band and orchestra, and these general designations cover assignments to any of the band or orchestral instruments, one of which is chosen by the student as his major instrument and studied through the four years.

140. Normal Piano Methods. 2(2-0); I. Miss Elsie Smith.

Discussion of principles and processes involved in various phases of piano study as a means of music education; study of teaching material for the piano; observation of lessons given in the preliminary piano classes.

142A, 142B. Orchestral Instruments I and II. 1(½-6) each; I and II, respectively. Mr. Lamont, Mr. Gordon, and assistants.

A course designed to acquaint the student with the methods of tone production and fingering of the most important instruments in the orchestra. Each instrument is studied for a period of from four to six weeks.

144A, 144B. Orchestral Repertoire I and II. 1(1-0) each; I and II, respectively. Mr. Lamont.

I: Classification and study of the materials to be used in grade-school and high-school orchestras and bands.

II: At least one symphony, one standard overture, and one concert suite are analyzed and memorized.

145. Methods of Teaching Music. 1(1-0); I. Mr. Lindquist, Mr. Lamont, and Miss Elsie Smith.

Methods of teaching fundamental technic, selection of teaching materials, and the outlining of courses of study. (Designed for public-school music students majoring in some instrument and preparing to teach it in high school; taught in separate divisions for voice, violin, piano, etc.)

PRACTICAL COURSES IN MUSIC

FOR UNDERGRADUATES

155. Music Fundamentals. 1(2-0); I and II. Mr. Sayre.

Class singing, study of note values, rhythm, scales, intervals, key signatures, etc.; and the application of this knowledge to the singing of part songs.

160A to 160H. Voice I to VIII. 4(2 private lessons, 12 hrs. preparation) each; I (Courses A, C, E, G) and II (B, D, F, H). Prerequisites: An entrance examination. (Prospective students should write the head of the Department of Music for a list of materials required.) Mr. Lindquist, Mr. Sayre, Miss Schobel, Miss Grossman, and Mr. Farrar.

Since production of tone in singing is governed by certain fundamental, explainable laws of phonetics and breath control, teaching the intelligent use of these laws is the constant objective of these courses. Coaching is given in the singing of French, Italian, and German songs; but the greater part of the work is in English, and pure enunciation of the mother tongue is constantly stressed. This series of courses is intended for students having special talent, and its purpose is to give sound technical training in the use of the vocal mechanism. The object is, to develop capable teachers and good performers.

161A to 161H. Voice A-I to A-VIII. 2(2 private lessons, 6 hrs. preparation) each; I (courses A, C, E, G) and II (courses B, D, F, H). Mr. Lindquist, Mr. Sayre, Miss Schobel, Miss Grossman, and Mr. Farrar.

Instruction similar to that given in courses 160A to 160H.

163A to 163H. Voice B-I to B-VIII. 1(1 private lesson, 6 hrs. preparation)

each; I (courses A, C, E, G) and II (courses B, D, F, H). Mr. Lindquist, Mr. Sayre, Miss Schobel, Miss Grossman, and Mr. Farrar.

Instruction similar to that given in courses 160A to 160H.

165A to 165H. VIOLIN I TO VIII. 4 credits, 12 hrs. preparation (for courses A to D); 6 credits, 24 hrs. preparation (for courses E to H); I (courses A, C, E, G) and II (courses B, D, F, H). Mr. Lamont.

Reserved for students showing an especial talent for the violin and entering college technically equipped to begin study of the standard works of violin literature; no special method advocated; a graceful and natural style insisted upon; outline of study so planned that an equi-balanced technic and sound musicianship are developed.

166. VIOLIN A. 2(2 private lessons, 6 hrs. preparation). No prerequisite. Mr. Lamont and Miss Jackson.

Fundamentals of the violin are very carefully presented.

167. VIOLIN B. 1(1 private lesson, 6 hrs. preparation). No prerequisite. Mr. Lamont and Miss Jackson.

Similar to course 166.

168A, 168B. VIOLIN ENSEMBLE I AND II. 2(2-0) each; I and II, respectively. Prerequisites: Four semesters of violin, viola, violoncello, or contrabass, or the equivalent. Mr. Lamont.

A practical course in the playing of string duets, trios, quartets, and other ensemble compositions.

170A to 170H. PIANO I TO VIII. 4(2 private lessons, 12 hrs. preparation) each; I (courses A, C, E, G) and II (courses B, D, F, H). Prerequisite: An entrance examination. (Prospective students should write the head of the Department of Music for a list of materials required.) Miss Elsie Smith, Miss Painter, Miss Jefferson, Miss Steel, and Mr. Stratton.

Intended for students having special talent. Its purpose is to give a sound technical foundation; to cultivate a thinking musicianship; to acquaint students with a generous amount of the best music literature; to develop capable teachers and good performers, and thus to furnish the foundation upon which the superstructure of the artists may be built. Instruction outlined for each year is a conservative estimate of what a student of average talent is expected to accomplish. Every two weeks a supplementary playing class is held, open to all piano students recommended for admission by their teacher. Opportunity is given for frequent playing; study of music terminology; discussion of how to study; and the development of knowledge of piano literature.

172A to 172H. PIANO A-I TO A-VIII. 2(2 private lessons, 6 hrs. preparation) each; I (courses A, C, E, G) and II (courses B, D, F, H). Prerequisite (for public-school music students): Entrance examination. Miss Elsie Smith, Miss Painter, Miss Jefferson, Miss Steel, and Mr. Stratton.

Attention given to sight reading and accompaniment for public-school music students and to developing a medium grade of pianistic performance. Students having sufficient talent to carry this course as a major subject throughout four years and fulfilling certain requirements may be granted a certificate to teach piano as an accredited subject in high school. See course 145.

174A to 174H. PIANO B-I TO B-VIII. 1(1 private lesson, 6 hrs. preparation) each; I (courses A, C, E, G) and II (courses B, D, F, H). Prerequisite: Same as for course 172A. Miss Elsie Smith, Miss Painter, Miss Jefferson, Miss Steel, and Mr. Stratton.

Instruction follows same plan as for courses 172A to 172H.

175A to 175D. PIANO C-I to C-IV. Designed for students who cannot meet entrance requirements for courses 170A, 172A, and 174A; No credit. May require one semester or longer, according to ability and previous training of student.

176A to 176H. PIANO ENSEMBLE I TO VIII. R(1-0); I (courses A, C, E, G) and II (courses B, D, F, H). Miss Painter.

During the first two years this work is in classes of four, for practice in sight reading and ensemble playing, the chief material used being orchestral work arranged for eight hands. During the last two years the work is done partly in classes of four, but develops into two-piano work and training for accompaniment and ensemble with various groups of orchestral instruments.

180A to 180H. Ensemble I to VIII. 1(1-0) each; I (courses A, C, E, G) and II (courses B, D, F, H). Mr. Lindquist, Mr. Lamont, and Mr. Gordon.
Required ensemble work may be taken in Choral Society (courses 190A to 190H), Orchestra (193A to 193H) or Band (196A to 196H).

182. Wind Instruments. 2(2 private lessons, 6 hrs. preparation); I and II. Mr. Gordon and assistants.
Opportunity for study of any wind instrument. Instruction begins with elementary scale and technical study and extends over the more difficult literature written for wind instruments.

183. Wind Instruments A. 1(1 private lesson, 6 hrs. preparation); I and II. Mr. Gordon and assistants.
Same as course 182, except that only one lesson a week is given.

184A to 184F. Recital I to VI. No credit for courses A, B, C, and E, 2 credits each for courses D and F; I (courses A, C, and E) and II (courses B, D, and F).
An entire solo recital in courses IV and VI.

186A, 186B. Repertoire I and II. 2(2-0) each; I and II, respectively. Mr. Lindquist.
An exhaustive study of vocal literature of all periods; songs prepared out of class and presented in class for criticism. (Classes limited to eight members.)

188. Practice Teaching of Music. 2(2-0); II. Mr. Lindquist, Mr. Lamont, Miss Elsie Smith, Mr. Gordon, and Miss Hartman.
Practice teaching in private classes for students in the piano, violin, voice and public-school music curricula.

MUSICAL ORGANIZATIONS

The existence of an organization of individuals is justified by the service such a body renders. The musical organizations at this College are second to none in the colleges of America. Students are here given a rare opportunity to study the great musical compositions that have been written for various ensemble combinations, and to render very good service to the College and community as well as to themselves in the presentation of public programs.

190A to 190H. Chorus I to VIII. (Weekly rehearsals, all special rehearsals, and public performances); I (courses A, C, E, G) and II (courses B, D, F, H). Prerequisite: Ability to read musical notation and to sing in tune. Written approval of the head of the department of music must be obtained. Mr. Lindquist.
The College Chorus presents "The Messiah" each fall and some standard oratorio or cantata in the Spring Festival.

The Men's Glee Club. The Men's Glee Club is composed of about forty of the best men's voices in the College. Membership is open to the best voices that try out from the whole College. This organization is available for a limited number of concert engagements throughout the state. Mr. Lindquist.

The Women's Glee Club. This is an organization of the young women of the College. The voices are selected in the same manner as are those of the Men's Glee Club. Mr. Sayre.

193A to 193H. Orchestra I to VIII. Required or optional without credit in semester hours in curricula in music; as elective in other curricula gives one hour of credit per semester. Weekly rehearsals, all special rehearsals

and public performances; I (courses A, C, E, G) and II (courses B, D, F, H). Mr. Lamont.

The College Orchestra is a definite organization in which discipline prevails and permanent membership with regular attendance is insisted upon. This body maintains a correct and well-balanced instrumentation, containing all the instruments of the modern symphony orchestra. The work is highly educational, and offers in the preparation of concerts and performances with the College Chorus the actual experience and routine necessary for efficient orchestra playing. Membership is open to all in the College who are capable of playing acceptably.

196A to 196H. Band I to VIII. Required or optional without credit in semester hours in curricula in music; as elective in other curricula gives one hour of credit per semester. Regular rehearsals, all special rehearsals, and public performances; I (courses A, C, E, G) and II (courses B, D, F, H). Mr. Gordon.

The College Band plays for all military functions and major athletic events. In addition to this, several concert appearances on the campus are made during the early fall and in the spring. The band plays the musical settings for the annual May Fete.

FEES IN MUSIC

Course	Gradation of Teachers 1	2	3	4	5	6	7	8
Two lessons each week for a semester:								
Piano	...	$40	$38	$36	$34	...	$28*	$26†
Voice	$46	40	38	36	...	...	...	26†
Violin	...	40	...	...	...	$32	...	26†
Other orchestral instruments	...	40	...	...	...	...	...	26†
One lesson each week for a semester:								
Piano	...	$22	$21	$20	$19	...	$16*	$15†
Voice	$25	22	21	20	...	...	...	15†
Violin	...	22	...	...	...	$18	...	15†
Other orchestral instruments	...	22	...	...	...	...	...	15†

Piano ensemble—$10 a semester
Orchestral Instruments I and II—$5 a semester.

Physical Education and Athletics

Professor Ahearn
Associate Professor Morris
Assistant Professor Corsaut
Assistant Professor McMillin
Assistant Professor Root
Assistant Professor Watson
Assistant Professor Washburn
Instructor Sappington
Assistant Trant
Assistant Myers

The purpose of the Department of Physical Education and Athletics is to assist the students of the College to live to the best advantage, and so to aid them in the formation of hygienic habits that during their college course they may make a profitable physical preparation for life.

All young men and all young women of the College are entitled to the privileges of the gymnasium, which is large and well equipped with all sorts of apparatus for physical training, with lockers, plunge baths, shower baths, and other accommodations. The gymnasium equipment is valued at $10,432.

In courses requiring a change of clothing, lockers may be obtained by making a locker deposit of $3. Upon return of lock, key and towels a refund of $1 is made in each case. Only one locker fee is required of a student in any one semester.

Equipment is furnished to acceptable candidates for varsity and freshman athletic teams. It is checked out to individual candidates and they are held responsible for it. It must be returned when called for by the property clerk. Failure to return or replace equipment when called for subjects the offender to a fine or to other disciplinary action.

* Fees for children.
† Student assistants' fees.

PHYSICAL EDUCATION FOR MEN

Physical education is required of all freshmen and sophomores unless excused for disability on recommendation of the college physician. Students excused from the required physical education give an equivalent amount of time to elective work.

The work of the department is based largely upon a physical examination given each student when he enters upon the work of the department. All students, whether taking work in the department or not, are entitled to receive a physical examination and advice as to their physical condition.

A diagnosis is made of the vital organs to ascertain their functional condition, and a complete inspection of the whole body is made to detect any weakness or deformity that may exist. Based upon the information thus obtained, advice is given and work assigned to students in accordance with their physical needs, tastes, and capabilities. All candidates for athletic teams are expected to pass a thorough physical examination.

Members of varsity and freshman athletic team squads may substitute such athletic work for the regular class work and will receive full semester credit for the work, provided they report regularly and for the full season of such sport.

COURSES IN PHYSICAL EDUCATION

FOR UNDERGRADUATE CREDIT—MEN

103, 104, 105, 106. PHYSICAL EDUCATION M. R(0-2) each semester of freshman and sophomore years. Mr. Corsaut and Mr. Root.

Personal hygiene and social problems; marching, calisthenics, apparatus and games, selected with the object of obtaining the best hygienic, educational and recreative results for the student.

The following activities may be elected by students in place of the gymnasium work: (*a*) Swimming: Beginning, advanced, and Red Cross life-saving. (Beginning swimming is a prerequisite for advanced swimming and for Red Cross life-saving. Students must pass a preliminary test before entering the Red Cross life-saving class unless they have passed the tests given in the advanced swimming class.) (*b*) Boxing, (*c*) Wrestling. Deposit, $3 each semester.

109. APPARATUS. 1(0-3); II. Prerequisite: Gymnastics I and II. Mr. Washburn.

Carefully selected and graded exercises on the various pieces of apparatus, fundamental apparatus stunts, mat exercises and tumbling. Deposit, $3.

113A. FIRST AID AND MASSAGE. 3(3-0); I. Prerequisite: Human Anatomy. Mr. Washburn.

Different forms of injuries and their temporary protection, including dressing, bandaging, transportation of the injured, etc., aid in case of accident, preparation of solutions, bandages, splints, etc., the methods of massage.

115A, 117A. GYMNASTICS I AND II. 2(1-3) and 2(0-6), respectively; I and II, respectively. Mr. Washburn.

I: Theory and practice of marching and calisthenics; tactics of the individual and of the group; types of calisthenics; principles of the gymnastic lesson; nomenclature and arrangement of exercises; fundamental exercises on the apparatus; mat work and games. Deposit, $3.

II: Continuation of course 115A, with the addition of gymnastic dancing, light apparatus exercises, and the composition and teaching of model lessons. Deposit, $3.

119. PERSONAL HYGIENE. 2(2-0); I. Mr. Washburn.

This course deals with health from the standpoint of the individual; care of the body, its organs, and vital processes.

121, 122. SWIMMING M-I AND M-II. 1(0-3) each; I and II, respectively Swimming I is a prerequisite for Swimming II. Mr. Washburn.

I: Instruction and practice of breast, side, back and crawl strokes, of div-

ing, treading water, and floating, land exercises and methods of breathing. Deposit, $3.

II: Continuation of Swimming M-I. Advanced swimming and diving, water games and stunts, Red Cross life-saving methods. Methods of teaching and conduct of swimming meets and programs are discussed. Deposit, $3.

123. Physiology of Exercise. 2(2-0); II. Prerequisites: Human Anatomy and Physiology. Mr. Washburn.

The effect of exercise on the tissues, systems, and organs of the body.

124A. Physical Diagnosis and Prescription. 3(3-0); I. Prerequisites: Gymnastics I and II, and Kinesiology. Mr. Washburn.

Students are taught to diagnose faulty conditions and, in cases that can be remedied by exercise, to give directions and write prescriptions of exercise.

126A, 127. Football I and II. 2(1-3) each. Mr. Bachman.

I: Study of the rules, theory, and the practice of fundamentals, equipment, care and treatment of injuries, and the use of mechanical devices. Deposit, $2.

II: Various positions on a football team, generalship and field tactics, and the various systems of offensive and defensive football. Deposit, $3.

128. Wrestling. 1(0-3); II. Mr. Northrip.

Rules, and the method of attack and defense in catch-as-catch-can wrestling; theories of wrestling, and wrestling psychology. Deposit, $3.

130A. Basket Ball. 2(1-3); I. Mr. Corsaut.

The rules, technic of basket shooting, foul throwing, catching and passing, dribbling, reverse turn, different styles of play, offense, defense, team work, selection of players, training and equipment. Deposit, $3.

132. Boxing. 1(0-3); II. Mr. Northrip.

Instruction in various modes of attack and defense; discussion of training, wrestling and boxing tournaments, and related topics. Deposit, $3.

135A. Baseball. 2(1-3); II. Mr. Corsaut.

Theory and technic, each position being studied separately; rules, schedules, equipment, strategy, signals, team organization, plays, and players. Deposit, $3.

136, 136B. Practice Teaching in Physical Education I and II. 1(0-3) and 2(0-6), respectively; I and II, respectively. Prerequisite: Junior standing. Mr. Washburn.

Under immediate supervision of the teachers and coaches, students assist in the physical education classes, athletic squads, intramural teams, and officiate in intramural games. The theory of teaching and officiating is also discussed. Deposit, $3 for each course.

136C, 136D. Practice Teaching in Physical Education III and IV. 2(0-6) each; I and II, respectively. Mr. Washburn.

Continuation of courses 136A and 136B. Deposit, $3 for each course.

140A. Track and Field Sports. 2(1-3); II. Mr. Bachman.

Rules and theory of track and field events; organization, conduct, officiating of meets, construction of all track equipment, training, dieting, equipment, and selection of material. Fundamentals of track and field sports. Deposit, $3.

141B. Kinesiology M. 3(3-0); I. Prerequisite: Human Anatomy. Mr. Washburn.

The mechanics of movements; elemental body movements analyzed, and principles involved applied to teaching of physical education. Text: Bowen and McKenzie, *Applied Anatomy and Kinesiology.*

142A. Public-school Program in Physical Education. 2(2-0); II. Prerequisite: Senior standing. Mr. Washburn.

The objectives of physical education; the educational, health and recreative significance, content of the school program, types of activity to be emphasized in grades, high school and college.

145A. Playground Management and Games. 2(2-0); II. Mr. Washburn.
Management and activities of the playground; equipment of playgrounds, arrangement of apparatus and places for games, track work, wading pools, etc.; municipal and industrial recreation centers, mass athletics, and intramural sports.

146B. Organization and Administration of Physical Education M. 2(2-0); II. Prerequisite: Junior standing. Mr. Washburn.
Organization and administration of the physical education department in various types of institutions; intercollegiate, interscholastic and intramural athletics.

COURSES IN PHYSICAL EDUCATION

FOR UNDERGRADUATE CREDIT—WOMEN

151A, 152A, 153, 154. Physical Education W. R(0-3) each; I and II of freshman and sophomore years. Miss Morris, Miss Watson, Miss Sappington, Miss Geyer, Miss Trant, and Dean Van Zile.
Several lectures on hygiene and social problems given under the direction of the dean of women; physical training part divided into one period of gymnastics and two periods of a sport or dancing which may be chosen by the student; dancing and swimming offered throughout the year; hockey, basket ball, baseball, volley ball, archery, tennis, track and field sports given in season. Deposit, $3 each semester.

156A to 156H. General Technic of Gymnastics I to VIII. 1(0-3) each; I(A, C, E, G) and II(B, D, F, H). Open as electives to juniors and seniors who have completed Phys. Ed. W-I to W-IV. Miss Watson.
Practical work in gymnastics, apparatus work, dancing, and sports. Deposit, $3 for each course.

158. First Aid. 1(1-0); I. Miss Sappington.
The prevention of accidents, and the treatment of injuries in an emergency. Text: *Red Cross Textbook on First Aid.*

160, 161. Folk Dancing I and II. 1(0-3) each; I and II, respectively. Prerequisites: For I, courses 151A to 154; for II, course 160. Miss Morris.
I: An elementary course in folk and national dancing and singing games.
II: Advanced course in the study of folk dances and national dances.
Deposit, $3 for each course.

163. Theory and Technic of Dancing. 1(1-0); II. Prerequisites: Folk Dancing II and at least one semester of advanced dancing.
Place of dancing in education, value of dancing as an art and as a means of expression; dancing correlated with music, literature, painting, and sculpture. Text: H'Doubler, *The Dance and Its Place in Education.*

165A. Sports Technic I. 1(1-0); I. Prerequisite: One season of advanced hockey and advanced basket ball. Miss Watson.
Rules and principles of coaching hockey, soccer, and basket ball; practice given in assisting with coaching of college sports. Text: *Official Rule Books.*

165B. Sports Technic II. 1(1-0); II. Prerequisites: One season of advanced baseball, field and track, and archery. Miss Watson.
Rules and principles of coaching baseball, track and field, and archery. Students assist with college sports. Text: *Official Rule Books.*

165C. Sports Technic III. 1(1-0); I. Prerequisites: One season of advanced swimming and tennis.
Rules and principles of coaching swimming, tennis, and volley ball. Students assist with college sports. Text: *Official Rule Books.*

168. Methods of Teaching Gymnastics. 1(1-0); II. Prerequisites: courses 156A to 156C.
Selection, classification, arrangement, and progression of gymnastic exer-

cises; practice teaching within the class. Text: Crombie and McKenzie, *Gymnastics in Education.*

170. Physical Diagnosis W. 3(3-0); I. Prerequisites: Anatomy, and Embryology and Physiology. Miss Watson.
Causes and symptoms of common diseases, deformities, and other abnormal conditions; methods of giving physical examinations.

172. Therapeutics and Massage. 2(1-3); II. Prerequisites: Anatomy, Kinesiology, and Physical Diagnosis.
Postural defects studied and exercises given for correction of each; general and local massage practiced for cases which can be treated by the Department of Physical Education. Deposit, $3.

174. Physiology of Exercise. 2(1-3); II. Prerequisites: Anatomy, and Embryology and Physiology.
Effect of exercise on the tissues, systems, and organs of the body. Text: McCurdy and McKenzie, *Physiology of Exercise.* Deposit, $3.

176. Organization and Administration of Physical Education W. 2(2-0); II. Prerequisites: Courses 161, 165A, 165B, 165C, 168 and 182.
Aims of physical education and the organization and administration of a department to meet those aims; the relation and responsibility to other departments. Text: Williams, *Organization and Administration of Physical Education.*

177. Corrective Gymnastics. 1(0-3); I and II. Miss Sappington.
Special exercises for students having physical defects, abnormalities, and other weaknesses and needing individual corrective work. Deposit, $3.

178. Folk Dancing. 1 credit; SS. Miss Morris and Miss Sappington.
Lectures on origin and values of folk dancing, principles of teaching folk dances, use of folk dances in festivals; practical work consisting of graded folk dances of different nations, and some practice teaching; a notebook required. Deposit, $3.

181A. Plays and Games. 1(0-3); I. Prerequisites: Courses 151A and 152A. Miss Morris.
Types of games suitable for different age periods, methods of coaching and managing group contests. Text: Bancroft, *Games for the Playground, Home, School and Gymnasium.* Deposit, $3.

182. Playground Management W. 1(1-0); II. Prerequisite: Plays and Games. Miss Watson.
Organization and administration of playground activities and equipment; history of the playground movement and the various theories of play. Text: Bowen and Mitchell, *The Theory of Organized Play.*

183. Elementary School Gymnastics. 1(0-3); SS. Miss Morris.
Principles of selection, methods of teaching and organization of work in elementary schools; practice of the activities used, and some practice teaching. Deposit, $3.

185. Interpretative Dancing. 1 credit; SS. Miss Watson.
Dancing, not dances, taught through logical, conscious control of body movements, motivated by music which has been studied and is understood; simple, common rhythms which are easily adapted to many uses. Deposit, $3.

187. Technic of Basket Ball, Baseball, and Hockey. 1 credit; SS. Miss Watson.
Methods of coaching high-school students. Deposit, $3.

188. Teaching and Adaptation of Physical Education. 3(3-0); I. Prerequisites: Courses 161, 156A, 156B, 165C, 168, and 182.
Problems of physical education and general principles of leadership; adaptation of material to meet needs of various groups and to meet aims and ideals of physical education. Text: Hetherington, *School Program in Physical Education.*

189. KINESIOLOGY W. 3(3-0); I. Prerequisite: Human Anatomy (Zoöl. 123). Miss Morris.

The mechanics of movement; elemental body movements analyzed and principles involved applied to the teaching of physical education. Text: Bowen and McKensie, *Applied Anatomy and Kinesiology.*

190. SWIMMING W. No credit; SS. Open to all women students.

A class for those who do not know how to swim, conducted by Miss Morris; a section for those who know how to swim, conducted by Miss Watson. Deposit, $3.

FOR UNDERGRADUATE CREDIT—MEN AND WOMEN

192. HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION. 3(3-0); II. Prerequisite: Sophomore standing. Miss Morris.

A survey of the field of physical education from ancient to modern times; aims and ideals of physical education and its relation to general education. Text: Rice, *A Brief History of Physical Education.*

196. SCHOOL HYGIENE. 3(3-0); I. Prerequisites: Personal Hygiene, Human Anatomy, and Physiology. Mr. Washburn.

Hygiene of the building and of the teacher; principles, content, and methods of health education.

Physics

Professor HAMILTON
Professor RABURN
Professor FLOYD
Associate Professor BRACKETT
Assistant Professor HARTEL
Assistant Professor LYON
Assistant Professor TAYLOR
Assistant Professor CHAPIN
Instructor PETERSON
Instructor MAXWELL

Recognizing the need of a thorough knowledge of the fundamental laws and principles involved in all physical changes, provision has been made, in the courses which follow, for both a theoretical and a practical treatment of the subject. Instruction is based upon the facts given in selected textbooks, and these topics are enlarged upon by lectures and illustrated by experimental demonstrations. The purpose is to give a training in exact reasoning, and a knowledge of principles that will be factors in the solution of problems in all branches of science as well as in everyday life.

The laboratory work which accompanies the courses in physics gives a student abundant opportunity to test the principal laws of the science; and, since he is expected to arrange and operate the apparatus, the work should enable him to acquire skill in manipulation, precision of judgment, and care in the use of delicate instruments. The laboratories are well arranged for the work, and the equipment provided is of a nature adapted to meet the requirement of accurate work in all courses. The manual in use in most of the courses is one prepared by the department to meet the exact conditions and equipment of the laboratory.

The equipment owned by this department has a value of $28,963.

COURSES IN PHYSICS

FOR UNDERGRADUATE CREDIT

101. HOUSEHOLD PHYSICS. 4(3-3); I and II. Includes parts of Physics 135, 140, 145, and 150. Mr. Hamilton, Mr. Floyd, and Miss Taylor.

Lectures and demonstrations, in which the laws relating to principles involved in appliances of the household are explained and illustrated. Deposit, $2.50.

120. PHOTOGRAPHY. 2(1-3); I and II. Mr. Hamilton.

Chemical and physical principles involved in photography; practice in making good negatives and prints. Deposit, $2.50.

130. Wireless Telephony. 2(1-3); I. Mr. Lyon.
The most efficient types of receiving and transmission sets, fundamental principles of electric waves, the most important factors in the erection of a good plant.

Laboratory.—Various radio circuits assembled by the student from standard parts and tried out for their transmitting and receiving properties. Charge, $2.50.

133. Meteorology. 2(2-0); II. Mr. Hamilton and Mr. Raburn.
Weather phenomena and the underlying principles of weather forecasting; factors that fix the climate of Kansas and of the United States; applications of weather to agriculture and the teaching of general science and physiography. Text: Milham, *Meteorology.*

135, 140. General Physics I and II. 4(3-3) each; I and II, respectively. Not open for full credit to students who have credit in Physics 101, nor to students who have credit in Physics 145 and 150. Prerequisite: Plane Trigonometry. Mr. Floyd, Mr. Brackett, Mr. Hartel, Mr. Lyon, and Mr. Chapin.
I: A thorough treatment of the general principles involved in mechanics, sound and heat. Text: Webster and Drew, *College Physics.*
II: Theory of electricity and light with special emphasis on those parts that have an immediate bearing on the work of other sciences, such as electrolysis, thermal effects, relation of electrical and mechanical energy. Text: As above.

Laboratory.—Exercises based on laws and principles discussed in the classroom and giving a practical illustration of the facts learned. Charge, $2.50 for each course.

145, 150. Engineering Physics I and II. 5(4-3) each; I and II each. Prerequisites: For I, Plane Trigonometry; for II, I. Not open for full credit for students who have credit in Physics 101, 135, and 140. Mr. Hamilton, Mr. Raburn, Mr. Brackett, Mr. Lyon, Mr. Maxwell, and Mr. Peterson.
I: A course in mechanics, sound, and heat; intended to give a thorough working knowledge of fundamental units and laws involved in force, work, power, and energy.
II: Units employed and fundamental laws of electricity; methods of producing a current, its uses, and the system by which electrical energy is measured; the principal phenomena of light and the laws that may have direct bearing upon light as a standard and method of measurement. Text: Duff and Lewis, *Physics.*

Laboratory.—I: Use of apparatus to test the laws of inertia, moments of force, moments of torsion, elasticity and rigidity, and other laws and principles involved in mechanics and heat. Charge, $2.50.
II: Measurements of electrical resistances, study of primary cells and transformation from mechanical into electrical energy; laws of reflection and refraction of light, measurements of wave length by means of the spectrometer, use of the interferometer, and photometry. Charge, $2.50.

155. Descriptive Astronomy. 3(3-0); II. Mr. Hartel.
An introductory course in astronomy largely descriptive in character. Text: Molton, *Introduction to Astronomy,* and a pocket star guide.

FOR GRADUATE AND UNDERGRADUATE CREDIT

203. Laboratory Technic. 2(0-6); I. Mr. Floyd.
Saw filing and tool grinding; glass blowing, cutting, grinding, polishing, and cementing; metal filing, drilling, soldering, and brazing; and making a set of punches, reamers, and cold chisels. In certain cases, special problems may be undertaken at a cost covering the raw materials. Deposit, $2.50.

213. Acoustics. 1(1-0); I. Prerequisite: Engineering Physics II. Mr. Floyd and Mr. Brackett.

Acoustic properties of building; architectural defects which give rise to poor acoustics; special methods to avoid such troubles in construction of buildings or to correct them in constructed buildings.

220. Molecular Physics and Heat. 3(2-3); I. Prerequisite: One year of college physics. Mr. Floyd and Mr. Raburn.

Molecular physics presented and utilized as a basis of an explanation of such phenomena as depend on the interaction of molecules and such as are fundamental in the presentation of the molecular theory of heat. Text: Edser, *Heat.*

222. Harmonics. 2(2-0); II. Prerequisites: One year of music. Mr. Hamilton and Mr. Floyd.

Lectures and demonstrations dealing with many facts of interest relating to construction of scales and chords.

224. Special Methods in the Teaching of Physics. 3(2-3); II. Prerequisites: Educational Psychology and College Physics. For credit toward state teachers certificate, must be taken in senior year. Mr. Floyd and Mr. Brackett.

An analysis of the present status of physics and of physics instruction in our high schools based on a critical study of the state text as well as other modern texts that may be used for reference.

Laboratory.—Formation and adaptation of courses suitable for high school.

230. Spectroscopy. 3(1-6); I. Prerequisites: College Physics and College Chemistry. Mr. Raburn and Mr. Floyd.

Theory and use of the spectroscope and spectrometer as instruments for identifying elements or their compounds, when rendered incandescent, by means of their characteristic spectra or definite wave lengths.

Laboratory.—Calibration of prisms and gratings for ready use in chemical laboratories; ample training in measuring wave lengths and in identifying the spectra of many substances.

231. Optics. 3(2-3); II. Prerequisite: One year of college physics. Mr. Hamilton and Mr. Floyd.

An advanced course in light, dealing with reflection, refraction, interference, diffraction, and polarization. Text: Wood, *Physical Optics.*

233. Radioactivity and the Electron Theory. 3(3-0); II. Prerequisites: College Physics and College Chemistry. Mr. Hamilton and Mr. Raburn.

Nature of the electron and its behavior in electric and magnetic fields; temperature effects and behavior of the electron in cathode tubes using a hot cathode; historical development of methods for determining mass and velocity of electrons; nature and effects of the various rays. Text: Crowther, *Ions, Electrons, and Ionizing Radiations.*

235. Storage Batteries. 2(1-3); II. Prerequisites: Physics and Chemistry. Mr. Hamilton, Mr. Floyd, and Mr. Maxwell.

History and development of the storage cell, lead and other types of cells; characteristics and behavior of cells on charge and discharge, care and operation of storage batteries, and renewal of sulphated cells. Text: Lyndon, *Storage Batteries.*

Laboratory.—Testing of batteries for efficiency, rebuilding of broken down cells, rejuvenation of sulphate cells.

237. Teachers' Course in Advanced Electricity. 2 cr.; SS. Prerequisite: Physics. Mr. Lyon.

Laboratory exercises following or intermixed with lectures; experiments and demonstrations, use of models, properties of alternating current circuits, rectifiers, transformers, transmitting and receiving radio circuits, radio sets suitable for use in high school; construction of these appliances by members of the class under direction of the instructor.

245. Radio Measurements. 2(1-3); I and II. Prerequisite: College Physics, and an elementary course in radio or equivalent. Mr. Lyon.

Standard radio measurements, such as determination of tube characteristics, calculation and design of inductances and capacities, properties and designs of antennas, tuning of transmitting sets, wave lengths and calibration of receiving sets, etc. The student may arrange to carry on an investigation of some special problem of radio.

250. Modern Physics. 3(2-3); I. Prerequisites: College Physics (1 yr.) and Chemistry (1 yr.). Mr. Brackett and Mr. Lyon.

Theories involved in recent advances in physics reviewed critically from the historical standpoint and the evidence for and against them discussed; each member of the class assigned to read several texts and articles on modern physics and to report and discuss his findings before the class.

252. Advanced Mechanics Laboratory. 1(0-3) or 2(0-6); I. Prerequisite: One year of college physics. Mr. Hamilton and Mr. Hartel.

A second course in mechanics experiments selected according to the needs and interests of each student from topics such as: Surface, tension, viscosity, simple harmonic motion, torsion, pendulum, flexure, moment of inertia, rigidity, etc.

254. Advanced Heat Laboratory. 1(0-3) or 2(0-6); II. Prerequisite: One year of college physics. Mr. Floyd and Mr. Chapin.

A second course in heat experiments selected according to the needs and interests of each student from topics such as: Differential thermometers, vaporization, ratio of specific heats, vapor density and humidity, thermal conductivity, the mechanical equivalent, isotherms, etc.

256. Advanced Electrical Laroratory. 1(0-3) or 2(0-6); I. Prerequisite: One year of college physics. Mr. Brackett and Mr. Lyon.

A second course in electrical experiments selected according to the needs and interests of each student from topics such as: The magnetometer, hysteresis, types and characteristics of galvanometers, effect of temperature on cells, thermoelectricity, ration of e/m, quadrant electrometers, potentiometer, power factor, rectifiers, vacuum tubes, etc.

258. Advanced Light Laboratory. 1(0-3) or 2(0-6); II. Prerequisite: One year of college physics. Mr. Raburn and Mr. Maxwell.

A second course in light experiments selected according to the needs and interests of each student from topics such as: Laws of lenses, laws of mirrors, the sextant, interferometer, polarimeter, gratings, total reflection, Brownian movements, Zeeman effect, photometry, calorimetry, etc.

260. Experimental Problems in Physics. 1(0-3) or 2(0-6); I, II, and SS, by appointment. Prerequisite: College Physics or equivalent. Mr. Hamilton and Mr. Brackett.

Selected problems involving physical phenomena or work preliminary to such investigations. This may count as part of the major requirement for the master's thesis provided the problem selected has the approval of the head of the department in which the major work is taken.

264. Biophysics. 3(2-3); II. Prerequisites: One year each of college physics or household physics, organic chemistry, and zoölogy or botany, or their equivalents. Mr. Floyd.

Some of the more important physical manifestations as related to living matter from the point of view of the organism as a whole and from that of the cell. For students of biology, nutrition, and medicine; lectures, library readings, and quiz; seminar reports on the literature.

FOR GRADUATE CREDIT

301. Research in Physics. 1 to 10 cr., I, II, and SS. Prerequisite: College Physics.

Problems in original investigations; new and important fields investigated.

Public Speaking

Professor Hill
Professor Shinn
Associate Professor Summers
Assistant Professor Heberer
Assistant Professor Burr

It is the constant effort of the Department of Public Speaking to relate the training in public speaking to the work of all other departments of the College and to harmonize it with the spirit of the College. With this object in view, students are trained in the presentation and discussion of the valuable ideas acquired in their various fields of study. The method pursued in this training is that of actual practice on the platform before an audience.

The department seeks to place itself at the service of those various organizations of the College which desire or need its assistance, and at the service of the communities of the state. In addition to its regular courses, it aims to make itself available as far as possible for individual rehearsals. It trains the orators of the College, coaches and directs college plays, and prepares intercollegiate debating teams. Students are urged to ally themselves with the organizations representing these various activities.

The equipment of this department has a value of $521.

COURSES IN PUBLIC SPEAKING

FOR UNDERGRADUATE CREDIT

101. Oral Interpretation. 2(2-0); I and II. Dr. Hill and Dr. Shinn.

Purpose, to enable the student to attain some proficiency in the art of oral interpretation; training to develop a natural style; points of theory and routine drill necessary for the development and use of the voice and for proper platform deportment.

102. Dramatic Reading. 2(2-0); I and II. Prerequisite: Course 101, or by arrangement with head of department. Dr. Hill, Dr. Shinn, and Miss Burr.

A continuation of course 101, involving more advanced study of the principles of oral interpretation and their application to platform reading.

106, 108. Extempore Speech I and II. 2(2-0) each; I and II, and II, respectively. Prerequisite: For II, I. Dr. Hill, Dr. Shinn, Mr. Summers, Mr. Heberer, and Miss Burr.

I: Preparation and delivery of short addresses based on prepared outlines.

II: Course 106 continued, with special attention to specific application of the principles of that course to particular occasions.

115. Lecture Recital. 2 credit; I and II. Prerequisites: Courses 101 and 102, or by special arrangement with the head of the department. Dr. Hill.

Preparation and delivery by the student of one extended lecture recital, lecture, or preparation and delivery of short recitals; a study of types.

121, 122. Argumentation and Debate I and II. 2(2-0) each; II, and by appointment, respectively. Prerequisite: For I, course 106; for II, course 121; or, for both, by arrangement with head of the department. Mr. Summers.

I: Fundamentals of argumentation as applied in debate, with special work on the making of debate outlines, collection and organization of material, structure and style of the debate speech, and methods of refutation; opportunity given to participate in a number of classroom debates for criticism.

II: The more technical phases of contest debating, with special attention to the outstanding problems of debate coaching, debate strategy and generalship, persuasion as used in debate, methods of increasing rebuttal effectiveness, and management of debates; participation in classroom debates; opportunity to gain experience in debate coaching or judging.

125. Parliamentary Procedure. 2(2-0); I. Mr. Summers.

How to organize and conduct meetings and take part in deliberative as-

semblies, with stress on three phases: How to conduct a meeting as chairman; how to take part from the floor; and how to organize and work in committee. Text: Hall and Sturgis, *A Textbook on Parliamentary Law.*

130, 135. Dramatic Production I and II. 2(2-0) each; I and II each. Prerequisites for II: I or consent of the instructor. Mr. Heberer.

I: The elementary principles of acting, diction, and make-up.

II: The theory and technique of stage craft with particular reference to producing plays in high schools; practical experience in scene design, lighting, and direction. Several one-act plays are presented during the semester in the workshop theater.

140. Pageant Composition. 3(3-0); I. Miss Burr.

History of community drama and pageantry; forms taken by the art in different times and places; recent and present tendencies; relation of the art to the modern community movement; its place in activities of school and church; practice in finding materials and arranging them in proper form for community drama and pageantry production.

145. Pageant Production. 3(3-0); II. Miss Burr.

Training in the organization of pageant groups; the scheme of organization and financing; the finding of characters for different parts, costuming, and the proper relation of episodes and musical accompaniments; opportunity for laboratory work in programs which require contributions from the field of pageantry.

150, 152. Development of the Theater I and II. 2(2-0) each; I and II, respectively. Mr. Heberer.

I: The theater from its beginning down to the end of the nineteenth century; types of plays, theaters, acting and production, and their relations to the time.

II: The modern theater, its problems, plays, actors, artists, and producers—a study of the American theater principally, and a survey of the contemporary stage.

Zoölogy

Professor Nabours
Professor Ackert
Professor Harman
Associate Professor Johnson
Assistant Professor Jewell
Assistant Professor Zimmerman
Instructor Gunns
Instructor Gloyd
Assistant Potter
Graduate Assistant Dowd
Graduate Assistant Larson
Graduate Assistant Stebbins

The courses have been planned to give a fundamental knowledge of the structures, functions, and relations of animals; information concerning the manner in which animals respond to the conditions of the environment; an appreciation of their human values; and a consideration of the problem of heredity and evolution.

General Zoölogy (course 105) constitutes a general survey, and forms an introduction to all lines in agriculture, general science, and home economics. Embryology (219B), Physiology (127), Cytology (214, Neurology (250), Advanced Embryology (220), Parasitology (208), Human Parasitology (218), Evolution and Heredity (217), Heredity and Eugenics (216), Advanced Human Physiology (235), and Historical Geology (Geol. 203) are preliminary to advanced work in animal breeding, animal husbandry, dairy husbandry, veterinary medicine, home economics, and nursing. Selections may be made among these courses and Embryology (219), Comparative Anatomy of Vertebrates (245), Ornithology (230), Field Zoölogy (205), Animal Ecology (211), Zoölogical Problems (203), Research in Zoölogy (301), and the Seminars (225, 227), by those who expect to do advanced work in zoölogy or entomology, or become teachers of biology.

The classrooms and laboratories are equipped with charts, models, microscopes, microtomes, paraffin baths and other apparatus both for elementary and advanced work, and a good natural history museum is available. A specially trained technician is in charge of equipment and available in matters connected with zoölogical technic. The equipment belonging to the department is valued at $33,930.

COURSES IN ZOOLOGY

FOR UNDERGRADUATE CREDIT

105. General Zoölogy. 5(3-6); I, II, and SS. Dr. Nabours, Dr. Ackert, Dr. Harman, Dr. Johnson, Dr. Jewell, Miss Zimmerman, and Mr. Gloyd.
Structures, functions, relations and evolution of types of both invertebrates and vertebrates in the class, laboratory, and in nature. Charge, $3.

109. Zoölogy and Embryology (Vet.). 5(3-6); I. Dr. Johnson.
A study of the principles and types of animal life, and of the development of vertebrate embryos. Charge, $3.

123A. Human Anatomy. 5(3-6); I. Prerequisite: General Zoölogy or equivalent. Miss Zimmerman.
Special attention to the human skeleton and organs; study of dissectible models, skeletons, charts, and living models. Charge, $3.

127. Physiology A. 3(2-3); II and SS. Prerequisites: Zoöl. 105 and General Chemistry or equivalent. Miss Zimmerman.
Functions of the organs and systems of the human body, with special emphasis on the muscular system. Charge, $2.

130. Physiology B. 4(3-3); I, II, and SS. Prerequisites: Zoöl. 105. Miss Zimmerman.
A general study of the functions of the human body. Charge, $3.

135. Embryology A. 3(2-3); I and SS. Prerequisites: Zoöl. 105 or equivalent. Dr. Harman.
Development of the germ cells, fertilization, origin of the germ layers, initiation and growth of systems of organs, establishment of fetal relations, and nutrition and growth of mammals. The chick and pig are used principally as laboratory materials. Charge, $2.

FOR GRADUATE AND UNDERGRADUATE CREDIT

203. Zoölogical Problems. 1 or 2 credits; I, II, and SS. Dr. Nabours, Dr. Ackert, Dr. Harman, Dr. Johnson, Dr. Jewell, and Miss Zimmerman.
Individual problems in heredity, parasitology, physiology, cytology, embryology, and ecology assigned by the instructors in charge.

205. Field Zoölogy. 3(1-6); I. Prerequisite: Zoöl. 105. Dr. Jewell.
A general survey of the animal kingdom with collection, preservation, and identification of local forms; notes on their life histories, distribution, and relationships. Charge, $2.

206. Zoölogical Technic. 1(0-3) or 2(0-6); II. Prerequisite: General Zoölogy, or equivalent. Dr. Nabours and Mr. Gunns.
Methods in killing, fixing, imbedding, using microtome, staining, dehydrating, and other processes in preparation of microscopical slides, principles of photomicrography, museum mounting and labeling, and introduction to taxidermy. Charge, $3.

208. Parasitology. 3(2-3); I. Prerequisite: Zoöl. 105, or 109. Dr. Ackert.
A study of the biology, pathology, and prophylaxis of the principal external and internal parasites of the domestic animals. Charge, $2.

211. Animal Ecology. 3(2-3) or 2(2-0); II. Prerequisite: Zoöl. 105, or equivalent. Dr. Jewell.
Relation of animals to the complete environment, with special attention

to the dynamic factors of the environment and their effect on the present status and future changes of the animal community. Charge, $2.

214. Cytology. 4(2-6); I. Prerequisite: Zoöl. 201, or equivalent. Dr. Harman.
Methods of preparing material for microscopical study, development of the germ cells, and theories of structures and functions of the different parts of the cell. Charge, $3.

216. Heredity and Eugenics. 2(2-0); I. Prerequisite: Zoöl. 105, or equivalent. Dr. Nabours.
Human inheritance and the interactions of nurture and heredity.

217. Evolution and Heredity. 3(2-3) or 4(2-6); II. Prerequisites: Zoöl. 105 and Genetics (An. Husb. 221), or equivalent. Dr. Nabours.
Development of the idea of evolution; evidence and principal theories of the causes of evolution; problems of variation, heredity, and experimental evolution.

218. Human Parasitology. 3(3-0); II. Prerequisite: Zoöl. 105, or equivalent. Dr. Ackert.
Biological, pathological and prophylactic phases of the principle parasitic maladies of man.

219A. Embryology B. 4(3-3); I, II, and SS. Prerequisite: Zoöl. 105 or equivalent. Dr. Harman.
The physiology of reproduction, developmental anatomy and physiology of mammals, with special reference to man. Charge, $3.

220. Advanced Embryology. 4(2-6); I. Prerequisites: Zoöl. 105 and 201 or 109, or equivalent. Dr. Harman.
Further study of the main facts of embryology, with special reference to their bearings upon biological theories, and a comparative study of the physiology of reproduction in mammals, including man. Charge, $3.

225. Zoölogy and Entomology Seminar. 1 credit; I and II. Prerequisite: Zoöl. 105, or equivalent.
Presentation of original investigations, reviews of papers appearing in current journals, summaries of recent advances in various fields, and discussion of various aspects of the fundamental problems of modern biology.

227. Genetics Seminar. 1 credit; the year. Prerequisite: Zoöl. 105, or equivalent. Dr. Nabours, Dr. Warren, Mr. Parker, and Dr. Ibsen.
Study and criticism of genetic experiments in plants and animals, biological and mathematical methods employed, validity of conclusions drawn.

230A. Ornithology. 3(2-3); II and SS. 1927-'28 and alternate years thereafter. Prerequisite: Zoöl. 105. Mr. Gloyd.
Study of birds with reference to classification, habits, habitats, adaptations, migrations, and economic importance. Charge, $2.

235. Advanced Human Physiology. 4(3-3); I. Prerequisites: Zoöl. 105 and Organic Chemistry. Miss Zimmerman.
The fundamental principles and theories of the functions of muscles, nerve, circulation, digestion, respiration, secretion and excretion. Charge, $3.

240. Taxonomy of Parasites. 2(1-3); I. Prerequisite: Zoöl. 105 or 109. Dr. Ackert.
Structure of animal parasites; relation of certain animal groups; principles of classification; identification of parasites of man and of domestic animals.

245. Comparative Anatomy of Vertebrates. 3(1-6); II. Prerequisite: Zoöl. 105, or equivalent. Dr. Johnson.
A comparative consideration of the skeletal, muscular, nervous, digestive, respiratory, circulatory, and urogenital systems and the sensory organs of vertebrates. Charge, $3.

250. Comparative and Human Neurology. 3(2-3); I. Prerequisite: Zoöl. 105. Dr. Johnson.

Structure, functions and evolution of the nervous system. Charge, $2.

FOR GRADUATE CREDIT

301. Research in Zoölogy. 1 to 5 credits; I, II, and SS. Prerequisite: Zoöl. 105. Dr. Nabours, Dr. Ackert, Dr. Harman, Dr. Johnson, Dr. Jewell, and Miss Zimmerman.

Individual research problems are assigned in the fields of heredity and experimental evolution, parasitology, cytology, embryology, ecology, physiology, neurology, and endocrinology.

The Division of Home Economics

MARGARET M. JUSTIN, *Dean.*

Modern research in the sciences and present-day development of the industries, arts, and professions have brought a recognition of the value of technical training as a part of the preparation for life's work. An educational plan which combines industrial, technical, and scientific subjects with the older general studies results to the student in the power to express, in everyday activities, the knowledge acquired in the classroom. It increases the capacity for productive work and develops the desire to realize in practical form the theories and principles studied. The aim of a collegiate course in home economics is not merely to increase the student's stock of information, but to stimulate interest in continued study or research, to train in accuracy in detail, to teach discrimination with regard to criteria by which to interpret results of work, and to cultivate an attitude of economic and social responsibility.

The course as outlined below is arranged to meet the needs of the following groups of students: Those who wish to teach, those who wish to enter graduate courses leading to technical or professional work, and those who wish to apply their knowledge to various problems of home life or in fields of industry and social service in which an understanding of home-economics subjects is essential to intelligent action. While emphasis is laid on the material and practical side of life, the training does not stop here. The young women are constantly reminded that life is not drudgery; that technical knowledge and scientific skill even fail to include the full meaning of education in its highest sense. They are taught that any training that fails to develop harmoniously body, mind, and spirit is inadequate and incomplete. They are brought face to face with ideals as well as with actualities, and are made to see that, while skillful labor gives dignity to life, grace, refinement, and self-poise are the highest requisites for true service.

That training given is as varied as it is broad. It includes a knowledge of the laws of health; an understanding of the sanitary requirements of the home; the study of values, both absolute and relative, of the various articles used in the home; the wise expenditure of money, time, and energy; the scientific principles underlying the selection and preparation of food; the right care of children; and the ability to secure efficient service from others. Instruction is methodical and thorough, and is suited to the circumstances of the students. Experience shows that such training teaches contentment, industry, order, and cleanliness, and fosters a woman's independence and feeling of responsibility.

The work in home economics includes:

A four-year curriculum, leading to the degree of Bachelor of Science.

A four-year curriculum leading to the degree of Bachelor of Science with special training in art.

A five-year curriculum leading to the degree of Bachelor of Science and a diploma in nursing.

Graduate work leading to the degree of Master of Science, majoring in home economics.

CURRICULA IN HOME ECONOMICS

The training in the four-year curriculum is both general and specific. Since scientific training is fundamental in the intelligent and successful administration of the home, strong courses in the sciences are given as a foundation for the special training in home economics. To the end that well-rounded culture may be attained, courses in English, history, economics, sociology, and psy-

chology receive due prominence. The time of the student is about equally divided among the purely technical subjects, the fundamental sciences, and studies of general interest. The courses in the related subjects are given in the different departments of the College, while the technical courses are given in the Division of Home Economics. In the junior and senior years opportunity is given for choice of electives, which makes it possible for students to specialize in some chosen line. To this end electives are to be chosen in groups combined logically in courses approved by the faculty or by the student's dean.

The four-year curriculum is recommended for all who desire to teach home economics, or to enter professional fields in which home economics may be applied.

The four-year curriculum offering special training in art is designed to meet the need of students especially interested in this field.

The five-year curriculum, offered in affiliation with the Charlotte Swift Hospital of Manhattan, enables the student wishing to take the Bachelor of Science degree and the full professional training in nursing to complete this work in five years. The first two years are spent at the College. The third and fourth years are spent at the Nursing School of the hospital, where both theoretical and practical training in nursing is given. During the fifth year required courses for the Bachelor of Science degree are completed at the College and electives are chosen which will prepare the student for the field of nursing in which she is most interested.

The demand for trained women to fill administrative and teaching positions in schools of nursing and to enter the various branches of public-health nursing is greater than the supply and offers a growing and attractive field of work for the college graduate.

Before entering upon this curriculum the student must report to the superintendent of the Hospital for a physical examination, and she must have her plan of study approved by the dean of the Division of Home Economics.

Further information concerning the work at the hospital may be obtained from the director of the Training School for Nurses of the Charlotte Swift Hospital, Manhattan.

The College does not assume the responsibility of insuring employment to graduates, but the latter rarely experience difficulty in obtaining remunerative positions.

Curriculum in Home Economics

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)*	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
Applied Design I Ap. Art 101	3(1-6)	Household Physics Physics 101	4(3-3)
Foods I Food and Nut. 101	3(1-6)	Clothing I Clo. and Text. 101	2(1-3)
Hygiene Child Welf. 101	2(2-0)	Costume Design I Ap. Art. 130	2(0-6)
Seminar (Home Econ. Fresh.) Gen. Home Econ. 101	R(1-0)		
Physical Education W Phys. Ed. 151A	R(0-3)	Physical Education W Phys. Ed. 152A	R(0-3)
Total	16	Total	16

* The number before the parenthesis indicates the number of semester hours of credit; the first number within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory each week.

SOPHOMORE

First Semester		Second Semester	
Organic Chemistry (HE) Chem. 121	5(3-6)	Foods II Food and Nut. 106	5(3-6)
English Literature Engl. 172	3(3-0)	American Literature Engl. 176	3(3-0)
General Zoölogy Zoöl. 105	5(3-6)	Embryology B Zoöl. 219A	4(3-3) *or*
Psychology A Educ. 101	3(3-0)	Physiology B Zoöl. 130	4(3-3)
		Current History Hist. 126	1(1-0)
		Clothing II Clo. and Text 111	3(1-6)
Physical Education W Phys. Ed. 153	R(0-3)	Physical Education W Phys. Ed. 154	R(0-3)
Total	16	Total	16

JUNIOR

First Semester		Second Semester	
German I Mod. Lang. 101	3(3-0) *or*	German II Mod. Lang. 102	3(3-0) *or*
French I Mod. Lang. 151	3(3-0)	French II§ Mod. Lang. 152	3(3-0)
Human Nutrition Food and Nut. 112	3(3-0)	Household Management Hshld. Econ. 107	3(2-3)
Household Microbiology Bact. 121A	3(1-6)	Textiles Clo. and Text. 116	3(2-3)
Economics Econ. 101	3(3-0)		
Art Elements Ap. Art 118	1(1-0)		
Elective	3(-)	Elective	7(-)
Total	16	Total	16

SENIOR

First Semester		Second Semester	
German Readings Mod. Lang. 111	3(3-0) *or*	American Government Hist. 151, 152, or 153	3(3-0)
French Readings Mod. Lang. 161	3(3-0)	Sanitation and Public Health Child Welf. 211	3(3-0)
American History I Hist. 201	3(3-0)	Seminar (Home Econ. Senior) Gen. Home Econ. 151	R(1-0)
Dietetics Food and Nut. 201	5(3-6)		
Elective	5(-)	Elective	10(-)
Total	16	Total	16

Total requirement for degree of Bachelor of Science in Home Economics, 128 hours.

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§ Students in the Division of Home Economics take a minimum of nine hours of French or German unless they have had previously one or more years high-school work in the language in question. In case French or German has been taken previously in high school only two more advanced courses of that language are required. Students who under these circumstances take less than nine semester credits in modern language are required to take additional elective hours, so that their total requirement is the same as for other students.

Curriculum Leading to the Degree of Bachelor of Science in Home Economics With Special Training in Applied Art

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
General Chemistry Chem. 110	5(3-6)	General Organic Chemistry Chem. 122	5(3-6)
Applied Design I Ap. Art 101	3(1-6)	Applied Design II Ap. Art 102	3(1-6)
Hygiene Child Welf. 101	2(2-0)	Clothing I Clo. and Text. 101	2(1-3)
Foods I Food and Nut. 101	3(1-6)	Costume Design I Ap. Art 130	2(0-6)
		Current History Hist. 126	1(1-0)
Physical Education W Phys. Educ. 151A	R(0-3)	Physical Education W Phys. Educ. 152	R(0-3)
Total	16	Total	16

SOPHOMORE

First Semester		Second Semester	
English Literature Engl. 172	3(3-0)	American Literature Engl. 175	3(3-0)
Psychology A Educ. 101	3(3-0)	Foods II Food and Nut. 106	5(3-6)
General Zoölogy Zoöl. 105	5(3-6)	Ancient Civilization Hist. 101	3(3-0)
Art Elements Ap. Art 118	1(1-0)	Applied Design III Ap. Art 105	2(0-6)
Sketching Ap. Art 120	2(0-6)	Clothing II Clo. and Text. 111	3(1-6)
Extempore Speech I Pub. Spk. 106	2(2-0)		
Physical Education W Phys. Educ. 153	R(0-3)	Physical Education W Phys. Educ. 154	R(0-3)
Total	16	Total	16

JUNIOR

First Semester		Second Semester	
German I Mod. Lang. 101	3(3-0)*or*	German II Mod. Lang. 102	3(3-0)*or*
French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 152	3(3-0)
Human Nutrition Food and Nut. 112	3(3-0)	History and Appreciation of Music Music 114	3(3-0)
Costume Design II Ap. Art 134	2(0-6)	Costume Design III Ap. Art 138	2(0-6)
Medieval Europe Hist. 102	3(3-0)		
Elective	5(-)	Elective	8(-)
Total	16	Total	16

SENIOR

First Semester		Second Semester	
German Readings Mod. Lang. 111	3(3-0) *or*	American History I Hist. 201	3(3-0)
French Readings Mod. Lang. 161	3(3-0)	Interior Decoration and Furnishing Ap. Art 114	3(1-6)
Principles of Art and Their Application I Ap. Art 124	3(3-0)	Principles of Art and Their Application II Ap. Art 126	3(3-0)
Child Welfare I Child Welf. 201	3(1-6)	History of Costume Clo. and Text. 265	1(1-0)
Elective	7(-)	Elective	6
Total	16	Total	16

Total requirement for degree of Bachelor of Science in Home Economics with special training in art, 128 hours.

Curriculum in Home Economics and Nursing

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
General Chemistry Chem. 110	5(3-6)	General Organic Chemistry Chem. 122	5(3-6)
Library Methods Lib. Ec. 101	1(1-0)	Human Anatomy Zoöl. 123A	5(3-6)
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Psychology A Educ. 101	3(3-0)		
Current History Hist. 126	1(1-0)		
Physical Education W Phys. Ed. 151A	R(0-3)	Physical Education W Phys. Ed. 152A	R(0-3)
Total	16	Total	16

SOPHOMORE

First Semester		Second Semester	
Foods II Food and Nut. 106	5(3-6)	Physiological Chemistry Chem. 231	5(3-6)
Embryology and Physiology Zoöl. 201	5(3-6)	General Microbiology Bact. 101	3(1-6)
American History I Hist. 201	3(3-0)	American Government Hist. 151, 152, or 153	3(3-0)
English Literature Engl. 172	3(3-0)	American Literature Engl. 175	3(3-0)
Physical Education W Phys. Ed. 153	R(0-3)	Human Nutrition Food and Nut. 112	3(3-0)
Total	16	Total	17

JUNIOR

(Replaced by two years at Charlotte Swift Hospital.)

Theoretical and practical work during the time includes:

First Year	Second Year
History and Ethics of Nursing	Surgery and Surgical Nursing and Bandaging
Hospital Economics	Obstetrics and Gynecology
Nursing Methods	Pediatrics
Medical Nursing	Diseases of Eye, Ear, Nose and Throat
Communicable Diseases	Nervous and Mental Diseases
Special Therapeutics and Massage	Materia Medica
	Problems in Nursing

Equivalent to 32 college hours.

SENIOR

First Semester		Second Semester	
(Specialized work in affiliated hospitals)		Sociology Econ. 151	3(3-0)
Equivalent to 16 college hours.		Dietetics Food and Nut. 201	5(3-6)
		Elective	8(-)
		Total	16

Total requirement for degree B. S. in Home Economics and Nursing, 129 hours.

Groups of Electives for Students in the Division of Home Economics

The groups given below are selected with a view to training students for the vocations in which home economics may be directly applied.

A sufficient number of hours may be chosen from any group to fill the elective requirement, or a smaller number of hours may be taken from a group and, for the remaining elective hours, advanced courses of related subject matter may be chosen.

Music may be added to any group.

Advertising, Buying and Salesmanship

First Semester		Second Semester	
Applied Design II Ap. Art 102	3(1-6)	Principles of Advertising Ind. Jour. 179	3(3-0)
Commercial Correspondence Engl. 122	3(3-0)	Written and Oral Salesmanship Engl. 123	3(3-0)
Oral English Engl. 128	3(3-0)	Applied Psychology Educ. 170	3(3-0)
Industrial Feature Writing I Ind. Jour. 167	2(2-0)	Accounting Practice I Math. 140A	3(2-3)
Technical Writing Engl. 207	2(2-0)	Business Management Econ. 126	2(2-0)

Certificate Requirements for Vocational Home Economics Teaching

EDUCATIONAL SUBJECTS REQUIRED

First Semester		Second Semester	
Educational Administration A or B Educ. 105 or 106	3(3-0)	Educational Psychology Educ. 109	3(3-0)
Special Methods in Teaching of Home Economics Educ. 132	3(3-0)	Supervised Teaching in Home Economics Educ. 160	3(3-0)
Vocational Education A Educ. 125	3(3-0)		

ADDITIONAL TECHNICAL SUBJECTS REQUIRED

First Semester		Second Semester	
Child Welfare I Child Welf. 201	3(1-6)	Practice Course in Household Management Hshld. Econ. 116	3(-)
Applied Design II Ap. Art. 102	3(1-6) *or*	Home Nursing Child Welf. 106	1(1-0)
Costume Design II Ap. Art 134	2(0-6)	Clothing III Clo. and Text. 126	3(1-6)

Clothing and Textiles

FIRST SEMESTER

Economics of the Household
Hshld. Econ. 265 ..... 2(2-0)

American History III
Hist. 203 ..... 3(3-0)

History of Costume
Clo. and Text. 265 ..... 1(1-0)

Sociology
Econ. 151 ..... 3(3-0)

Labor in Clothing and Textiles Industries
Clo. and Text. 260 ..... 1(1-0)

General Physics I
Physics 135 ..... 4(3-3)

General Physics II
Physics 140 ..... 4(3-3)

SECOND SEMESTER

Principles of Art and Their Application I
Ap. Art 124..... 3(3-0)

Costume Design II
Ap. Art 134 ..... 2(0-6)

Clothing III
Clo. and Text. 126..... 3(1-6)

Elementary Journalism
Ind. Jour. 151 ..... 2(2-0)

Problems in Clothing and Textiles
Clo. and Text.*256..... 1 or 2

Statistical Methods Applied to Education
Educ. 223 ..... 3(3-0)

Plane Trigonometry
Math. 101 ..... 3(3-0)

Principles of Advertising
Ind. Jour. 179 ..... 3(3-0)

Magazine Features
Ind. Jour. 270 ..... 2(2-0)

Designing and Decorating

FIRST SEMESTER

Object Drawing I
Arch. 111 ..... 2(0-6)

History of Architecture I
Arch. 154A ..... 2(2-0)

History of Architecture III
Arch. 158A ..... 2(2-0)

Rural Architecture
Arch. 153 ..... 2(0-6)

Chaucer
Engl. 260 ..... 3(3-0)

Shakespearean Drama I
Engl. 273 ..... 3(3-0)

The English Romantic Revival
Engl. 278 ..... 3(3-0)

World Classics I
Engl. 280 ..... 3(3-0)

SECOND SEMESTER

Object Drawing II
Arch. 114 ..... 2(0-6)

History of Architecture II
Arch. 157A ..... 2(2-0)

History of Architecture IV
Arch. 160A ..... 2(2-0)

History of English Literature
Engl. 181 ..... 3(3-0)

Shakespearean Drama II
Engl. 274 ..... 3(3-0)

Interior Decoration and Furnishing
Ap. Art 114 ..... 3(1-6)

Food and Nutrition

(Research; Nutrition Specialist; Public Health Work; Specialized Teaching)

FIRST SEMESTER

Physical Chemistry
Chem. 206 ..... 5(3-6)

Microchemical Methods of Analysis
Chem. 245 ..... 1(0-3)

Advanced Human Physiology
Zoöl. 235 ..... 4(3-3)

Hygiene Bacteriology
Bact. 206 ..... 4(2-6)

Problems in Food Economics and Nutrition I
Food and Nut. 248..... 2 to 5

Food Economics and Nutrition Seminar I
Food and Nut. 251..... 2(2-0)

Field Work in Nutrition
Food and Nut. 215..... 3(2-3)

Bacteriological Problems
Bact. 226 ..... 1 to 4

College Algebra
Math. 104 ..... 3(3-0)

Plane Trigonometry
Math. 101 ..... 3(3-0)

The Nutrition of Development
Food and Nut. 210..... 2(2-0)

SECOND SEMESTER

Physiological Chemistry
Chem. 231 ..... 5(3-6)

Biochemical Preparations
Chem. 234 ..... 5(0-15)

Quantitative Analysis
Chem. 241 ..... 5(1-12)

Food Analysis
Chem. 257 ..... 3(0-9)

Histology I
Path. 102 ..... 2(1-3)

Food Economics and Nutrition Seminar II
Food and Nut. 252..... 2(2-0)

Methods of Investigation in Foods and Nutrition
Food and Nut. 265..... 2(1-3)

Human Parasitology
Zoöl. 218 ..... 3(3-0)

Statistical Methods Applied to Education
Educ. 223 ..... 3(3-0)

Dietetics

FIRST SEMESTER

Institutional Economics I
Inst. Econ. 201 ..... 3(1-6)
Physiological Chemistry
Chem. 231 ..... 5(3-6)
Field Work in Nutrition
Food and Nut. 215 ..... 3(2-3)
Food Economics and Nutrition Seminar I
Food and Nut. 251 ..... 2(2-0)
Child Welfare I
Child Welf. 201 ..... 3(1-6)

SECOND SEMESTER

Institutional Economics II
Inst. Econ. 205 ..... 3(3-0)
Dietetics for Abnormal Conditions
Food and Nut. 205..... 2(1-3)
Meats (HE)
An. Husb. 176 ..... 1(0-3)
Institutional Marketing
Inst. Econ. 215 ..... 2(2-0)
Methods of Investigation in Foods and Nutrition
Food and Nut. 265..... 2(1-3)
The Nutrition of Development
Food and Nut. 210..... 2(2-0)

Home Making

FIRST SEMESTER

Child Welfare I
Child Welf. 201 ..... 3(1-6)
Home Nursing
Child Welf. 106 ..... 1(1-0)
The Modern Family
Child Welf. 216 ..... 2(2-0)
Sociology
Econ. 151 ..... 3(3-0)
Community Organization
Econ. 267 ..... 3(3-0)
Problems in Foods I
Food and Nut. 243 ..... 1 to 3
Practice Course in Household Management
Hshld. Econ. 116 ..... 3(-)
World Classics I
Engl. 280 ..... 3(3-0)
The Nutrition of Development
Food and Nut. 210..... 2(2-0)

SECOND SEMESTER

Child Welfare II
Child Welf. 206 ..... 3(3-0)
Principles of Art and Their Application I
Ap. Art 124 ..... 3(3-0)
Economics of the Household
Hshld. Econ. 265..... 2(2-0)
Gardening
Hort. 122 ..... 3(3-0)
Clothing III
Clo. and Text. 126..... 3(1-6)
Meats (HE)
An. Husb. 176 ..... 1(0-3)
History of English Literature
Engl. 181 ..... 3(3-0)
Psychology of Childhood and Adolescence
Educ. 208 ..... 3(3-0)

Child Care and Training

FIRST SEMESTER

Sociology
Econ. 151 ..... 3(3-0)
Social Problems
Econ. 257 ..... 2(2-0)
The Modern Family
Child Welf. 216..... 2(2-0)
Field Work in Nutrition
Food and Nut. 215..... 3(2-3)
Heredity and Eugenics
Zoöl. 216 ..... 2(2-0)
Child Welfare I
Child Welf. 201..... 3(1-6)

SECOND SEMESTER

History of the Home
Hist. 225 ..... 3(3-0)
Psychology of Childhood and Adolescence
Educ. 208 ..... 3(3-0)
Child Welfare II
Child Welf. 206..... 3(3-0)
Home Nursing
Child Welf. 106..... 1(1-0)
Positive Child Health
Child Welf. 111..... 2(2-0)
Problems in Child Welfare
Child Welf. 221..... 1 to 5

Institutional Economics

FIRST SEMESTER

Institutional Economics I
Inst. Econ. 201..... 3(1-6)
Commercial Correspondence
Engl. 122 ..... 3(3-0)
Magazine Features
Ind. Jour. 270..... 2(2-0)
Technical Writing
Engl. 207 ..... 2(2-0)
Problems in Institutional Administration
Inst. Econ. 210..... 1 to 5
Institutional Economics II
Inst. Econ. 205..... 3(3-0)

SECOND SEMESTER

Meats HE
An. Husb. 176 ..... 1(0-3)
Principles of Advertising
Ind. Jour. 179..... 3(3-0)
Institutional Marketing
Inst. Econ. 215..... 2(2-0)
Institutional Furnishings
Ap. Art 116..... 3(1-6)
Institutional Accounting
Math. 131 ..... 3(3-0)

Lecturing and Demonstrating

FIRST SEMESTER

Oral English
Engl. 128 ..... 3(3-0)

Oral Interpretation
Pub. Spk. 101 ..... 2(2-0)

Extempore Speech I
Pub. Spk. 106 ..... 2(2-0)

Sociology
Econ. 151 ..... 3(3-0)

Technical Writing
Engl. 207 ..... 2(2-0)

Practice in Food Demonstrations
Food and Nut. 117..... 1(0-3)

Meats HE
An. Husb. 176 ..... 1(0-3)

Industrial Feature Writing I
Ind. Jour. 167..... 2(2-0)

SECOND SEMESTER

Dramatic Reading
Pub. Spk. 102 ..... 2(2-0)

Extempore Speech II
Pub. Spk. 108 ..... 2(2-0)

Applied Psychology
Educ. 170 ..... 3(3-0)

Rural Sociology
Econ. 156 ..... 3(3-0)

Community Organization
Econ. 267 ..... 3(3-0)

Industrial Writing
Ind. Jour. 161 ..... 2(2-0)

Methods for Extension Workers in Foods
Food and Nut. 260..... 2(1-3)

Industrial Feature Writing II
Ind. Jour. 171 ..... 2(2-0)

Sanitary Science; Food and Market Inspection

FIRST SEMESTER

Hygienic Bacteriology
Bact. 206 ..... 4(2-6)

Quantitative Analysis A
Chem. 250 ..... 3(1-6)

SECOND SEMESTER

Dairy Chemistry
Chem. 254 ..... 3(1-6)

Food Analysis
Chem. 257 ..... 3(0-9)

Pathogenic Bacteriology I
Bact. 111 ..... 4(2-6)

Meat Inspection
Path. 216 ..... 2(2-0)

Social Welfare Work

FIRST SEMESTER

Child Welfare I
Child Welf. 201 ..... 3(1-6)

Home Nursing
Child Welf. 106 ..... 1(1-0)

The Modern Family
Child Welf. 216 ..... 2(2-0)

Economics in the Household
Hshld. Econ. 265 ..... 2(2-0)

Sociology
Econ. 151 ..... 3(3-0)

Latin America
Hist. 207 ..... 2(2-0)

Community Organization
Econ. 267 ..... 3(3-0)

Field Work in Nutrition
Food and Nut. 215..... 3(2-3)

SECOND SEMESTER

Child Welfare II
Child Welf. 206 ..... 3(3-0)

Labor Problems
Econ. 233 ..... 2(2-0)

Rural Sociology
Econ. 156 ..... 3(3-0)

Social Problems
Econ. 257 ..... 2(2-0)

Modern Europe II
Hist. 223 ..... 3(3-0)

Immigration and International Relations
Hist. 228 ..... 2(2-0)

Problems in Child Welfare
Child Welf. 221 ..... 1 to 5

Applied Art

Professor Holman
Assistant Professor Everhardy
Assistant Professor Arnold
Instructor Morris
Instructor Harris

Taste is cultivated through the impressions received in everyday surroundings and not through the occasional visits to art galleries. We are not so sensitive to discords in color and line as we are to discords in sound, because we have not trained our eyes as we have our ears. "The study of design furnishes a means of exercising and thus developing good taste in connection with the things which make up environment of everyday life and of awakening appreciation in nature and in art." Home decoration is a study of the factors which produce beautiful surroundings that make for enjoyment and peace. Each course consists of lectures, studio laboratory work, field observation work, and reading.

Students pursuing the curriculum offering special training in art are urged to confer with the department head in regard to their special interests in the field.

This department owns equipment valued at $4,276.

COURSES IN APPLIED ART

FOR UNDERGRADUATE CREDIT

101. Applied Design I. 3(1-6); I.* Miss Holman, Miss Everhardy, and Miss Arnold.

Principles which control the use of color and form and the selection and arrangement of elements in the production of objects themselves and in their uses as parts of a whole; clothing and home furnishings scored as to design; a natural motif adapted to material, function, and form. Text: Batchelder, *Design in Theory and Practice.* Deposit, 75 cents.

102. Applied Design II. 3(1-6); I. Prerequisites: Course 101. Miss Holman and Miss Everhardy.

A further study of harmonies, adaptation of natural motifs, and design as applied to fabrics and other materials; art masterpieces and articles of common use studied according to principles of color and form. Text: Crane, *The Basis of Design.* Deposit, 75 cents.

105. Applied Design III. 2(0-6); II. Prerequisite: Course 102. Miss Everhardy and Miss Arnold.

A continuation of course 102, with emphasis on art structure. Deposit, 75 cents.

108. House Furnishings. 2(1-3); II. Prerequisites: Course 101. Miss Holman and Miss Harris.

The decorative phase of design studied in the solving of problems which occur in the furnishings of the house. Deposit, 25 cents.

110, 111. Public-school Art A and B. 2(1-3) each; SS.

A: Fundamentals of all art expressions; problems, including representation, design, construction work and picture study for all grades. Deposit, 25 cents.

B: Problems for graded work as an aid to the student in adapting art work to the need of his community. Deposit, 25 cents.

114. Interior Decoration and Furnishing. 3(1-6); II. Prerequisite: Applied Design II. Miss Holman and Miss Harris.

* The number before parenthesis indicates the number of semester hours of credit; the first numeral within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week. I, II and SS indicate that the course is given the first semester, second semester and summer session respectively.

A study of color, form, and arrangement of house furnishings. Deposit, 75 cents.

116. Institutional Furnishings. 3(1-6); II. Prerequisites: Applied Design II. Miss Morris.
A study of fundamental principles of design; these principles applied to problems involving selection and use of wall, floors, furniture, finishes, covering, linen, china, and silver. Deposit, 25 cents.

118. Art Elements. 1(1-0); I and II. Miss Holman and Miss Arnold.
Line and form, tone and color, and their arrangement as found in the fine arts, industrial arts, and the arts of every day.

120. Sketching. 2(0-6); II. Prerequisite: Applied Design I. Miss Arnold and Miss Harris.
Objects sketched singly and in groups in the studio and out of doors, the media employed being pencil, charcoal, and brush.

124. Principles of Art and Their Application I. 3(3-0); II. Prerequisite: Applied Design I. Miss Holman and Miss Arnold.
A general survey of art periods as an index to what art quality is; an examination of the religious, political, and social aspects of art expression; architecture, furniture, textiles, sculpture, pictures, and lesser art objects compared as to their art quality; survey of the modern fields of landscape, architecture, furnishings, clothing etc.; application of principles controlling art expression to these fields. Texts: Neuhaus, *The Appreciation of Art;* and Mullen, *The Approach to Art.*

126. Principles of Art and Their Application II. 3(3-0); I. Prerequisite: Course 124. Miss Holman and Miss Arnold.
Continuation of Principles of Art and Their Application I.

130, 134, 138. Costume Design I, II, and III. 2(0-6) each. Prerequisites: For I, course 101; for II, course 130; for III, course 134. Miss Arnold and Miss Morris.
I: Color, line form, and texture in modern dress; consideration of individual requirements; brief survey of historic costume; this course a design basis for garment selection and construction. Deposit, 75 cents.
II: Review of line, form, and proportion in modern costume and in the human figure as the structure upon which costume is built; special problems in dress design; the Hambridge Theory of Dynamic Symmetry; stress on color in modern and historic costume for the stage. Deposit, 75 cents.
III: A continuation of course 134, particularly in relation to historic costume. Deposit, 75 cents.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201, 202. Problems in Applied Design I and II. 3(1-6) each; SS. Prerequisites: For I, courses 102 and 134; for II, course 201. Miss Everhardy.
I: Special phases of decorative design considered with reference to the student's experience and development of projects through research and invention.
II: The aim, to develop appreciation for art in everyday surroundings and as far as time permits to develop skill in expression; problems adapted to the needs of the student.

206. Problems in Teaching Art. 3(1-6); SS. Prerequisites: Applied Design I and Special Methods Teaching Home Economics or its equivalent. Miss Holman.
For the high school teacher who is correlating art with home economics subjects, particularly for the teacher of art subjects connected with vocational training; training given through lectures and class discussions of methods, consideration of suitable laboratory equipment, use of illustrative material, and preparation of courses of study. Text: Woodbury, *The Art of Seeing.*

211. Problems in Adaptation of Period Costumes. 2(0-6); I. Prerequi-

sites: 9 credits in Applied Design; consult instructors. Miss Arnold and Miss Morris.

Problems to develop taste in selection and use of historic material for dress, plays and pageants. The aim is to increase appreciation and improve technique. Notes and sketches are required. Deposit, 75 cents.

FOR GRADUATE CREDIT

301. Art Research. 2 to 10 credits, by appointment. For prerequisites, consult head of department.

A problem in art selected from some of the following fields: (*a*) Historic research; (*b*) organization of curriculum; (*c*) methods of teaching; (*d*) theoretical aspects of art education.

Child Welfare and Euthenics

Professor Ford
Assistant Professor Dobbs
Instructor Cockrell
Graduate Assistant Kell
Graduate Assistant Jones

Home economics must always be chiefly concerned with the individuals in the homes, and the various phases of home economics gain in importance only as they contribute something of value to the lives of individuals. If homes are to prepare their members to help in the progress of society and to receive the highest satisfactions from life, they must insure three things.

They must first of all insure a childhood safeguarded by the wise application of the latest principles of science. The environment must be such as to foster the fullest development of desirable qualities and to suppress the development of undesirable qualities. In the second place, through right family relationships and family living based on sound principles and high ideals, the home must insure such help and sense of security to the individual as can come in no other way. In the third place, the home must lay a sure foundation for both the physical and mental health of its members. We realize now that health is much more than the absence of disease. It is positive, buoyant, joyous health that homes must strive to give individuals to-day.

To help educate in right living, from the standpoint both of individual and family well-being, and to further whatever is of benefit to children are the aims of the courses offered in this department.

COURSES IN CHILD WELFARE AND EUTHENICS

FOR UNDERGRADUATE CREDIT

101. Hygiene. 2(2-0); I and II. Miss Dobbs.

Personal hygiene as a means of maintaining and improving health; the best methods of caring for the sick in the home.

106. Home Nursing. 1(1-0); I and II. Prerequisites: Household Microbiology, and Embryology and Physiology. Miss Dobbs.

Training in the home care of the sick; treatment in case of emergencies. Charge, 50 cents.

111. Positive Child Health. 2(2-0); I and II. For prerequisites, consult instructor. Miss Dobbs.

Public health aspects of school hygiene, the object of health development in educational systems, organization and administration of health work in public schools, and the teaching of hygiene by practical demonstration and the project method.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Child Welfare I. 3(1-6); I and II. Prerequisites: Embryology and Physiology, Psychology, and Human Nutrition. Dr. Ford and Miss Cockrell.

Development, care, and training of the infant and preschool child.

Laboratory.—Assisting and observing in the nursery school. Each student makes an intensive study of one child. Charge, $1.

206. Child Welfare II. 3(3-0); II. Prerequisites: Embryology and Physiology, Psychology, Human Nutrition. Dr. Ford.
The development, care, and training of older children; community problems of child welfare.

211. Sanitation and Public Health. 3(3-0); I and II. Prerequisites: Household Physics, Embryology and Physiology, and Household Microbiology. Miss Dobbs.
The household as a factor in health conservation, emphasis being placed upon the interrelation of home and community health.

216. The Modern Family. 2(2-0); II. Prerequisite: Senior or graduate standing. Consult instructor. Dr. Ford.
Functions of the modern family and the various problems which confront it.

221. Problems in Child Welfare. 1 to 5 credits; I and II. Prerequisite: Child Welfare. Consult instructor. Dr. Ford.
Individual investigation of a special problem in some phase of child welfare; conferences, and reports at appointed hours.

FOR GRADUATE CREDIT

301. Research in Child Welfare and Euthenics. 2 to 10 credits; I. Prerequisites: Consult instructors. Dr. Ford and Miss Dobbs.
Opportunity for original research in the field of child welfare and euthenics which may form the basis of work for a master's thesis.

Clothing and Textiles

Professor Baker
Associate Professor Cowles
Assistant Professor Bruner
Instructor Hess
Instructor Quinlan
Graduate Assistant Latzke
Research Assistant Viemont

Clothing is an important factor in both the physiological and psychological well-being of the individual and of the family. The wise selection of the clothing requires a high degree of skill in the application of hygienic, economic, and æsthetic principles. The preservation and care of clothing are based upon a practical knowledge of chemistry, entomology, and bacteriology. In the construction of garments, art, applied art, and technic are presented in their proper relations in order to train students in fundamental principles and enable them to utilize these principles in their everyday practices. In this department advanced courses are offered for students who wish electives which lead to vocational, professional, and business positions.
The equipment belonging to this department is valued at $7,645.

COURSES IN CLOTHING AND TEXTILES

FOR UNDERGRADUATE CREDIT

101. Clothing I. 2(1-3); II. Miss Cowles, Miss Viemont and Miss Latzke.
Adaptation and use of commercial patterns; kinds, qualities, and quantities of materials; elementary facts which underlie the successful selection of textile fabrics.

Laboratory.—The planning and construction of garments from wash materials. Deposit, $1.25.

111. Clothing II. 3(1-6); I and II. Prerequisites: Clothing I and Costume Design I. Miss Cowles and others.
Consideration of bases for the selection of clothing; clothing as a financial investment; comparison of home- and factory-made garments; clothing budgets

in relation to the rest of the income; clothing standards in their relation to the economic, social and æsthetic life of the community; principles of hygiene and sanitation as applied to clothing.

Laboratory.—The planning of clothing budgets of individuals and of family groups; planning and construction of garments for children, men, and women with emphasis on rapidity of construction and labor-saving methods. Deposit, $1.25.

116. Textiles. 3(2-3); I and II. Prerequisites: Organic Chemistry and Clothing II (Clothing II may parallel). Mrs. Hess and Miss Bruner.

The social and economic development of the textile industry, from the "industrial revolution" to the present time; the combination of art, science, and mechanics that makes possible the elaborateness of modern textiles; the chief aim of the course, to develop a clear and sound judgment in the selection of textile fabrics for household and personal use.

Laboratory.—Chemical, physical, microscopic tests on textile fibers, yarns, and fabrics. Charge, $2.

126. Clothing III. 3(1-6); I and II. Prerequisites: Courses 101, 111, 116, and Costume Design I. Open to seniors and others upon consultation with the instructor. Miss Quinlan.

Æsthetic and modish adaptation of materials to the individual; self-expression taught through dress; emphasis on problems of the high school teacher and original designs for clothing and millinery. Deposit, $1.75.

FOR GRADUATE AND UNDERGRADUATE CREDIT

256. Problems in Clothing and Textiles. 1 to 2 credits; I and II. Prerequisites: Courses 101, 111, 116, and Costume Design I. Miss Baker and others.

An assigned problem in some phase of clothing or textiles, fabric analysis, physical experiment, costume study, or chemical analysis of fabric. Charge, $2 and up, depending on the nature of the work.

260. Labor in the Clothing and Textile Industries. 1(1-0); II. Prerequisites: Clothing II, Textiles, and Economics, or approval of instructor. Miss Quinlan.

Old and modern methods of textile production; problems arising from the conditions of labor, especially as affecting the mental, moral, and physical health of the worker; methods used in bettering these conditions.

265. History of Costume. 1(1-0); I. Prerequisites: Costume Design I and II, and Textiles, or approval of instructor. Miss Quinlan.

Ancient and modern costumes with their various phases of development; comparison of classes and the relative cost of living in the various ages.

FOR GRADUATE CREDIT

301. Research in Clothing and Textiles. 2 to 10 credits; I and II. For prerequisites, consult instructors. Miss Baker, Mrs. Hess, and Miss Bruner.

A research problem in the hygienic or economic aspects of clothing or an investigation of textiles may be chosen as the basis of a thesis for the master's degree, the nature of the problem depending on the problem courses elected. Text: Schluter, *How to Do Research Work.* Charge, $5 and up, according to the nature of the work.

305. Clothing Economics. 2(2-0); II. Prerequisites: Graduate standing; consult instructor. Miss Baker.

Organization of the clothing trades and industries; wholesale and retail clothing markets; wages and standards of efficiency in workmanship; conditions of work in the textile and clothing industries; standardization of fabrics; and legislation concerning textiles.

310. Advanced Textiles. 3(1-6); I. Prerequisites: Graduate standing; consult instructors. Mrs. Hess and Miss Bruner.

Special work in the analysis of fabrics, scientifically and commercially; assigned problems and detailed work in textiles and dyeing. Charge, $3.

312. Experimental Textiles. 2 to 3 credits; by appointment. Prerequisites: Advanced Textiles. Mrs. Hess and Miss Bruner.

The work covered in this course consists primarily of experimental work on and with textiles. Written reports of all work done will be required before a student will receive credit for the course. Charge, $5.

315. Hygiene of Clothing. 2 to 3 credits; I. Prerequisites: Graduate standing; consult instructor. Miss Baker.

Special investigations of clothing in relation to health and its effect upon anatomical form, muscular development, and physiological functions.

320. Clothing IV. 3(2-3); II. Prerequisites: Graduate standing; consult instructor. Miss Quinlan.

Sociological, historical, and philosophical aspects of costume; relation of dress to civilization, architecture, religion, occupation, and amusement; a special problem assigned. Deposit, $2.25.

Food Economics and Nutrition

Professor Pittman
Professor Kramer
Associate Professor Chaney
Assistant Professor Ascham
Assistant Professor Ahlborn
Instructor Tucker
Instructor Vail
Graduate Assistant Raffington
Graduate Assistant Bailey

Food is one of the determining factors in the health of the individual and of the family. The selection of wholesome and economical food requires the constant application of chemistry and of sanitary science. The preparation and preservation of food involve processes dependent upon physics, chemistry, and bacteriology. In the modern science of nutrition and dietetics, the student learns the chemical and physiological principles involved in the nutritive processes of the body and the quantitative application of these principles in planning food for the individual and the group. Science, applied science, and practice are presented in their proper relations in order to train the student in fundamental principles and to enable her to gain by experience methods of translating these principles into her everyday household practices. Advanced courses in this department provide training for teachers of foods, dietitians, demonstrators, extension workers, and similar professions.

The equipment belonging to this department is valued at $18,687.

COURSES IN FOOD ECONOMICS AND NUTRITION

FOR UNDERGRADUATE CREDIT

101. Foods I. 3(1-6); I and II. Prerequisite: Entrance physics; parallel: Chemistry I. Miss Ahlborn, Miss Tucker, and Miss Vail.

History and development of fire, cookery, and cooking utensils; principles involved in different methods of cooking and in preservation of foods.

Laboratory.—Practical cookery, illustrating the various methods of preparing foods; study of stoves, fuels, food preservation, and simple meal planning. Deposit, $4.25.

106. Foods II. 5(3-6); I and II. Prerequisites: Organic Chemistry, and Foods I or equivalent. Miss Pittman, Miss Ahlborn, and Miss Tucker.

Classification, composition, occurrence, and general properties of foodstuffs; food values in relation to cost; legal and sanitary aspects of food products handled in commerce.

Laboratory.—Foods are tested to show chemical composition, solubility in various reagents, and similar qualities. Food preparation is from the experimental standpoint. Recipes are compiled and food products are scored. Deposit, $4.50.

112. Human Nutrition. 3(3-0); I and II. Prerequisites: Organic Chemistry, Embryology and Physiology, and Foods II.* Dr. Kramer.

Special characteristics and nutritive functions of food constituents; methods of investigation which have established the quantitative basis in dietetics; digestive and metabolic processes and products with emphasis on energy relations; quantitative relations of ash constituents; nitrogen and mineral balances; comparative economy in nutrition; and growth of different types of food materials.

117. Practice in Food Demonstrations. 1(0-3); II. Prerequisite: Foods II. Miss Pittman and others.

Instruction in the technic of food demonstrations; each student allowed opportunity for practice in various types of demonstrations. Deposit, $3.25.

120. Applied Nutrition. 3(3-0); I. Dr. Chaney.

Practical nutrition for the college student, including food requirements, food selection and food habits. A course designed for men and women students not majoring in Home Economics.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Dietetics. 5(3-6); I and II. Prerequisites: Human Nutrition and Foods II. Dr. Chaney, Miss Ahlborn, and Miss Tucker.

Daily food requirements in health and in disease throughout infancy, childhood, adolescence, adult life, and old age; typical dietaries for each period of life; milk formulæ; the problem of satisfying the diverse requirements in families and other groups.

Laboratory.—Studies of weight, measures, and cost of some of the common food materials; calculations and quantitative preparation of standard portions and combinations of foods; practice in marketing and serving; and other practical applications of classroom theories. (For graduate students, an assigned problem instead of marketing and serving.) Deposit, $6.25.

205. Dietetics for Abnormal Conditions. 2(1-3); II. Prerequisite: Dietetics. Dr. Kramer and Dr. Chaney, and Miss Ascham.

Varying dietetic requirements in different pathological conditions, such as diabetes, nephritis, gout, gastric ulcer, etc. (For students who expect to qualify as professional dietitians.)

Laboratory.—Demonstrations of special foods used in such conditions, and computation of dietaries. Deposit, $3.25.

210. The Nutrition of Development. 2(2-0); II. Prerequisites: Human Nutrition and Dietetics. Dr. Chaney.

Food requirements in pregnancy, fetal life and lactation. Infant feeding, food for the preschool child, the school child, and the adolescent.

215. Field Work in Nutrition. 3(2-3); I, by arrangement. Prerequisites: Human Nutrition, and Dietetics. Dr. Chaney and ———.

Survey work along nutritional lines and corrective work with malnourished individuals, either separately or in groups. Charge, $2.

243, 244. Problems in Foods I and II. 1 to 3 credits each; I and II respectively. Prerequisites: Foods II, and Human Nutrition. Miss Pittman, Miss Ahlborn, and Miss Vail.

I: Problems in food assigned for individual study. Deposit, $2.25 per credit.

II: A continuation of I, or may be elected independently. Deposit, $2.25 per credit.

* Students from other divisions desiring to elect Human Nutrition may substitute an equivalent number of hours in other sciences for Embryology and Physiology, and Foods II.

248, 249. Problems in Food Economics and Nutrition I and II. 2 to 5 credits each; (conferences, laboratory work, and reports); I and II respectively. Prerequisite: Senior or graduate standing. Dr. Kramer and Dr. Chaney.

I: Problems in the nutritive value of foods; feeding experiments; dietary studies, or practice in the methods commonly used in the simpler experiments in nutrition, are assigned for individual study. Charge, depends on problem chosen.

II: Continuation of course 248 or may be elected independently. Charge depends on problem chosen.

251, 252. Food Economics and Nutrition Seminar I and II. 1 or 2(2-0) each; I and II respectively. Prerequisite: Human Nutrition. Dr. Kramer.

I: Assigned reading and discussion of topics in the fields of food economics and nutrition, with special attention to recent literature bearing on problems in dietetics in both normal and pathological conditions, on growth, and on normal and subnormal nutrition in infancy and childhood.

II: Continuation of I or may be elected independently.

260. Methods for Extention Workers in Foods. 2 credits; II. Prerequisite: Dietetics. Miss Pittman.

Origin and development of the extension field in home economics; food problems of the extension worker and methods suggested for handling them; federal, state, and county organizations considered. Some field work required.

265. Methods of Investigation in Foods and Nutrition. 2(1-3); I and II, by appointment. Prerequisite: Dietetics. Dr. Kramer and Miss Ascham.

Current methods in investigation of foods and of problems in nutrition.

Laboratory.—Laboratory procedures in simple food analyses, digestion and metabolism experiments, and animal feeding technic. Charge, $3; deposit, 25 cents.

FOR GRADUATE CREDIT

305. Research in Food Economics and Nutrition. 1 to 10 credits; I and II. For prerequisites, consult instructors. Miss Pittman, Dr. Kramer, and Dr. Chaney.

Individual research problems, which may form the basis for the thesis submitted for the master's degree. Charge, $5 and up, depending on the problem chosen.

General Home Economics

Dean Justin
Associate Professor Rust*

101. Home Economics Freshman Seminar. R(1-0); I. Dean Justin, department heads of division, and Professor C. V. Williams.*

The purpose of the seminar is: (1) The orientation of the student to her college environment. (2) The development of the ability to study. (3) Guidance in choice of one of the several fields of home economics for her profession.

151. Home Economics Senior Seminar. R(1-0); II. Dean Justin.

The opportunities and responsibilities of the home economist are presented, and means for professional growth and personal advancement of the trained woman are stressed.

There are investigations that touch the various fields of home economics which are primarily approached from the standpoint of organization and presentation of home economics, taking subject matter from the departments and correlating it into a general program. Such investigations may be carried on in conjunction with the Department of Education or with the Department of Home Economics in Extension.

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. Problems in Organization and Presentation of Home Economics. 1 to 5 credits; I and II. Prerequisite: Senior or graduate standing. Dean Justin and Mrs. Rust.*

This course permits opportunity for study of problems of organization and administration in this field.

FOR GRADUATE CREDIT

301. Research in Organization and Presentation of Home Economics. 1 to 10 credits; I and II. Prerequisite: Graduate standing. Dean Justin and Mrs. Rust.*

Individual research problems in phases of organization and administration for home economics. May be chosen as the basis for thesis for the master's degree. The nature of the problem will depend upon the student's major interest.

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*Of the Department of Education.

Household Economics

Dean JUSTIN
Instructor GUNSELMAN
Instructor ————
Graduate Assistant DUGAN

The successful administration of the home depends upon the wise expenditure of time, money and effort, the maintenance of healthful and comfortable home conditions and an appreciation of the importance of the home and its relation to the community. Through the courses in this department, training is given in household equipment, problems of household administration and standards of living.

Those preparing to become directors of residence, specialists in household management, teachers, or research workers in this field find suitable courses in this department.

The department owns equipment valued at $4,976.

COURSES IN HOUSEHOLD ECONOMICS

107. HOUSEHOLD MANAGEMENT. 3(2-3); I and II. Prerequisites: Household Physics, Foods II, and Clothing II. Miss Gunselman and Miss Muse.

Organization and simplification of housework through efficiency in house planning and construction, and in methods of housekeeping; standards of living and family expenditures, budgets, and accounts; problems of household service.

Laboratory.—Comparative studies of mechanical household appliances; placing and grouping of equipment; economy and efficiency tests of cooking utensils, floor and wall finishes, and cleaning agents; time studies of household tasks. Charge, $1.

116. PRACTICE COURSE IN HOUSEHOLD MANAGEMENT. 3 credits; I and II. Prerequisites: Household Physics, and Foods II. Prerequisite, or parallel: Household Management. Consult instructor. Miss Gunselman.

Opportunity is given in the practice house for the practical application of principles of science and art to the home. The aim is to develop good judgment in planning expenditures of time, money and effort, and in evaluating the factors that determine standards of living.

FOR GRADUATE AND UNDERGRADUATE CREDIT

243. PROBLEMS IN HOUSEHOLD ECONOMICS. 1 to 5 credits; I and II. Prerequisite: Household Management. Consult instructor. Dr. Justin and Miss Gunselman.

Special problems for individual investigation in standards of living and family expenditures; housing, household equipment, organization and methods of housework; use of time freed from housework, or social aspects of the household and of the family.

265. ECONOMICS OF THE HOUSEHOLD. 2(2-0); II. Prerequisites: Foods II and Economics. Miss Gunselman.

Problems of income, housing, standards of living, budgets and accounts.

FOR GRADUATE CREDIT

301. RESEARCH IN HOUSEHOLD ECONOMICS I. 2 to 10 credits; I. Prerequisites: Consult instructors. Dr. Justin, and Miss Gunselman.

An individual research problem in the field of household administration. This may form part or all of the basis for a master's thesis.

Institutional Economics

Professor ————
Associate Professor IBSEN
Assistant Professor MUSTARD
Assistant JOHNSON
Graduate Assistant MORRIS

The successful administration of the institution entails wise expenditure of time, energy, and money, that requirements usually supplied by the home, such as food and shelter, may be furnished to the person away from home in a satisfying way. Through courses is this department, training is given in Institutional Economics that prepares the students as directors of residence, cafeteria or lunch-room managers, and dietitians.

The equipment of this department is valued at $13,500.

COURSES IN INSTITUTIONAL ECONOMICS

FOR GRADUATE AND UNDERGRADUATE CREDIT

201. INSTITUTIONAL ECONOMICS I. 3(1-6); I and II. Prerequisite: Foods II; prerequisite or parallel: Human Nutrition. Mrs. Ibsen, and Miss Mustard.

Food problems of institutions, including marketing, preparation of food, arrangement of menus and cost of service.

Laboratory.—Carried on in College cafeteria where food is prepared in large quantities for serving. Charge, $2.50.

205. INSTITUTIONAL ECONOMICS II. 3(3-0); I and II. Prerequisite: Institutional Economics I; Graduate students may parallel Institutional Economics I and II. Mrs. Ibsen.

Study of various types of institutions; qualifications and duties of the manager; planning, equipping and general care of buildings; organization of work; management of employees; institutional accounting; office management.

210. PROBLEMS IN INSTITUTIONAL ADMINISTRATION. 1 to 5 credits; I and II. Prerequisite: Institutional Economics I; Prerequisite or parallel: Institutional Economics II. Consult instructors. Mrs. Ibsen, and Miss Mustard.

Individual investigation of the administration of cafeteria, lunch and tea rooms, dining halls, dormitories, clubs and other institutions. Conferences are held and reports made at appointed hours.

215. INSTITUTIONAL MARKETING. 2(2-0); II. Prerequisite: Foods II. Miss Mustard.

Study of producing areas, storage, local and general marketing of fresh, canned and dehydrated vegetables, major and minor meats, and fresh, canned and dried fruits.

218. INSTITUTIONAL FOOD BUDGETS. 1(1-0); II. Prerequisite: Foods II. Miss Mustard.

A detailed study of cost dispersions of the food budget and the factors affecting the amount spent for various foods.

220. RESEARCH IN INSTITUTIONAL ECONOMICS. 2 to 10 credits; I and II. For Prerequisites, consult instructors. Mrs. Ibsen, and Miss Mustard.

Home Economics in the Summer School

In addition to instruction in various branches of home economics available to teachers during the regular College year, the College offers numerous courses in this subject in the Summer School. These courses apply directly on the curriculum in home economics, or on graduate credit.

A special circular giving in detail the courses offered in the Summer School may be had by applying to the vice president of the College.

The Division of Veterinary Medicine

RALPH R. DYKSTRA, *Dean*

The College has one of the best-equipped schools of veterinary medicine in the West. It is rated in class "A" by the United States Department of Agriculture, which rating places it among the best in the United States and Canada. In addition to giving the student the best possible technical training in veterinary medicine, the course is designed to give the broad culture necessary for men who are to take their places in public affairs. Professional men, such as veterinarians, are placed in a more or less public relation to the communities they serve. They must have a broad groundwork in cultural and ethical training, which will win them the confidence and respect of their communities. Success is measured in something more than dollars and cents, and the man whose view of life is no broader than his profession adds but little to the world and its happiness. The training given by the College in veterinary science seeks to emphasize the value of the man as a man, as much as his value as a specialist.

The Division of Veterinary Medicine gives most of the technical work in the curriculum in veterinary medicine, a general description of which is given below. The division is housed in the Veterinary buildings, which were erected at a cost of over $175,000, and are thoroughly equipped throughout. Veterinary Hall contains modern classrooms, and its laboratories possess the necessary appliances for illustrating the several subjects required. The mode of instruction is more specifically detailed in succeeding sections.

The policy adhered to in the instruction in all the departments is that the science of veterinary medicine is the foundation, and the art merely supplementary. A thorough drill is given in the foundation studies, and later in the curriculum practical application of these is made in actual field work. This result is a thoroughly scientific veterinary education.

In the arrangement of the schedule of the veterinary curriculum it is implied that the courses should be followed in regular sequence, as each year's work depends upon the work done the previous year. Certain courses, however, may be selected as electives if a student has the necessary prerequisites. These courses are mentioned in the list of electives.

THE CURRICULUM IN VETERINARY MEDICINE

Veterinary medicine has made remarkable advances within recent years, and is taking its place alongside human medicine as a science. In truth, medical science and veterinary science are but specialized branches of the same science, and must be developed together. The modern veterinarian takes his place in the community as a professional man of education and culture. With the general improvement of the live stock on the farms, and with the advance of live stock in value, there is constant increase in the demand for skilled physicians to care for them.

The veterinarian, while primarily trained to conserve the health of farm animals, has yet larger service to render in preventing disease common to both man and beast from being communicated from domestic animals to man. Moreover, he must see that the animals slaughtered for meat are healthy and that the products are handled under such conditions as to render them suitable for human food. The public is now demanding that milk and other food products be free from contamination and that they be incapable of transmitting dangerous diseases, like tuberculosis, typhoid fever, scarlet fever, and diphtheria. There is ample work for all of the thoroughly competent veterinarians that the colleges of the country will train.

The curriculum in veterinary medicine at the Agricultural College was established to give the young men of this state an opportunity to pursue these studies in an agricultural environment, where the facilities offered by other branches of the College would be at their command. While the instruction in this curriculum is largely technical, enough subjects of a general character are included to give a sound education and a broad outlook. Better to fit the veterinarian to deal wisely with the live-stock problems which he has to meet, he is required to take the work in live-stock feeding, breeding and judging, and in milk inspection, zoölogy, and embryology, in addition to his purely professional work.

The diploma from this school is recognized by the United States Department of Agriculture, by the United States Civil Service Commissions, by the American Veterinary Medical Association, and by the various examining boards of the several states and territories of America where it has been presented.

THE CURRICULUM IN ANIMAL HUSBANDRY AND VETERINARY MEDICINE

The combined curriculum in animal husbandry and veterinary medicine has been outlined so that students may receive the degree of Bachelor of Science at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two years more, thus securing both degrees in six years.

This curriculum is prepared especially for students who intend to become managers of live-stock farms or to enter special lines of veterinary practice.

THE CURRICULUM IN GENERAL SCIENCE AND VETERINARY MEDICINE

The combined curriculum in general science and veterinary medicine has been so arranged that students may receive the degree of Bachelor of Science at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two years more, thus securing both degrees in six years. The curriculum is intended especially for students who intend to pursue teaching or research work in agricultural experiment stations.

Curriculum in Veterinary Medicine

FRESHMAN

First Semester		Second Semester	
Anatomy I Anat. 103	3(2-3)*	Anatomy II Anat. 108	8(4-12)
Histology I Path. 102	2(1-3)	Histology II Path. 107	4(1-9)
Chemistry (Vet.) Chem. 105	5(3-6)	Elementary Organic Chemistry Chem. 123	3(2-3)
Zoölogy and Embryology (Vet.) Zoöl. 109	5(3-6)		
Military Science (Vet.) I Mil. Tr. 121	1½(0-4)	Military Science (Vet.) II Mil. Tr. 122	1½(0-4)
Physical Education M Phys. Ed. 103	R(0-2)	Physical Education M Phys. Ed. 104	R(0-2)
Total	16½	Total	16½

* The number before the parenthesis indicates the number of semester hours of credit; the first number within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory each week.

SOPHOMORE

First Semester		Second Semester	
Anatomy III Anat. 112	4(1-9)	Anatomy IV Anat. 116	3(1-6)
Comparative Physiology I Anat. and Physiol. 221	5(4-3)	Comparative Physiology II Anat. 226	3(2-3)
Medical Botany Bot. 126	2(1-3)	Pathogenic Bacteriology I Bact. 111	4(2-6)
College Rhetoric I Engl. 101	3(3-0)	Pathology I Path. 202	3(2-3)
Live Stock Judging An. Husb. 120	3(2-4)	Principles of Feeding An. Husb. 152	3(3-0)
		Dairy Judging Dairy Husb. 104	1(0-3)
Military Science (Vet.) III Mil. Tr. 123	1½(0-4)	Military Science (Vet.) IV Mil. Tr. 124	1½(0-4)
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Total	18½	Total	18½

JUNIOR

First Semester		Second Semester	
Surgery I Surg. and Med. 101	3(3-0)	Surgery II Surg. and Med. 106	3(3-0)
Diagnosis Surg. and Med. 170	2(2-0)	Diseases of Large Animals I Surg. and Med. 174	4(4-0)
		Farm Poultry Production Poult. Husb. 101	2(1-2, 1)
Materia Medica Surg. and Med. 157	4(4-0)	Therapeutics Surg. and Med. 163	3(3-0)
Pharmacy Surg. and Med. 166	1(0-3)		
Pathology II Path. 207	3(2-3)	Pathology III Path. 212	5(4-3)
Pathogenic Bacteriology II Bact. 116	4(2-6)		
Clinics I Surg. and Med. 137	1(0-6)	Clinics II Surg. and Med. 140	1(0-10)
Total	18	Total	18

SENIOR

First Semester		Second Semester	
Surgery III Surg. and Med. 111	3(3-0)	Surgery IV Surg. and Med. 116	3(3-0)
Diseases of Large Animals II Surg. and Med. 177	5(5-0)	Infectious Diseases of Large Animals Surg. and Med. 181	5(5-0)
		Diseases of Small Animals Surg. and Med. 186	2(2-0)
Jurisprudence Anat. and Physiol. 161	1(1-0)	Poultry Diseases Bact. 217	2(2-0)
Pathology IV Path. 214	3(2-3)	Operative Surgery Surg. and Med. 121	1(0-3)
Meat Inspection Path. 216	2(2-0)	Obstetrics Surg. and Med. 131	3(3-0)
Parasitology Zoöl. 208	3(2-3)	Dairy Inspection II Dairy Husb. 118	1(0-3)
Clinics III Surg. and Med. 143	1(0-12)	Clinics IV Surg. and Med. 146	1(0-12)
Total	18	Total	18

Number of semester hours required for graduation, 142.

ELECTIVES

First Semester		Second Semester	
Applied Anatomy Anat. 206	1(0-3)	Special Histology Path. 252	3(1-6)
Vaccine Manufacture I Path. 227	2(1-3)	Vaccine Manufacture II Path. 230	2(1-3)

First or Second Semester

Pathological Technic and Diagnosis I Path. 220	2(0-6)
Pathological Technic and Diagnosis II Path. 221	4(0-12)
Research in Pathology Path. 302	1 to 10(-)
Special Anatomy Anat. 202	2 to 4(-)
Applied Anatomy Anat. 206	1(0-3)
Problems in Physiology Anat. 215	3 to 5(-)

Curriculum in Animal Husbandry and Veterinary Medicine[1]

FRESHMAN

Freshman year of the Curriculum in Agriculture.

SOPHOMORE

First Semester		Second Semester	
General Zoölogy Zoöl. 105	5(3-6)	Pathogenic Bacteriology I Bact. 111	4(2-6)
Anatomy I Anat. 103	3(2-3)	Anatomy II Anat. 108	8(4-12)
Soils Agron. 130	4(3-3)		
Elements of Horticulture Hort. 107	3(2-3)	College Rhetoric II Engl. 104	3(3-0)
Infantry III Mil. Tr. 103	1½(0-4)	Infantry IV Mil. Tr. 104	1½(0-4)
Physical Education M Phys. Ed. 105	R(0-2)	Physical Education M Phys. Ed. 106	R(0-2)
Agricultural Seminar Gen. Agric. 103	R	Agricultural Seminar Gen. Agric. 103	R
Total	16½	Total	16½

JUNIOR

First Semester		Second Semester	
Embryology A Zoöl. 135	3(2-3)	Principles of Feeding An. Husb. 152	3(3-0)
Anatomy III Anat. 112	4(1-9)	Anatomy IV Anat. 116	3(1-6)
Histology I Path. 102	2(1-3)	Histology II Path. 107	4(1-9)
Genetics An. Husb. 221	3(3-0)	Elementary Journalism Ind. Jour. 151	2(2-0)
		Journalism Practice I Ind. Jour. 154	2(0-6)
Electives[2]	4(1)	Farm Crops Agron. 101	4(2-6)
Agricultural Seminar Gen. Agric. 103	R	Agricultural Seminar Gen. Agric. 103	R
Total	16	Total	18

1. This curriculum is so arranged that students may receive the degree of Bachelor of Science (in agriculture) at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two more years.

2. All electives must be officially approved before assignment by both the head of the Department of Animal Husbandry and the dean of the Division of Agriculture.

SENIOR

First Semester		Second Semester	
General Entomology Ent. 203	3(2-3)	Agricultural Relationships[3] Gen. Agric. 105	R(1-0)
Agricultural Economics Ag. Ec. 101	3(3-0)	Farm Organization Ag. Ec. 106	3(2-3)
Comparative Physiology I Anat. and Physiol. 221	5(4-3)	Comparative Physiology II Anat. and Physiol. 226	3(2-3)
		Pathology I Path. 202	3(2-3)
Electives[2]	5(-)	Electives[2]	7(-)
Agricultural Seminar Gen. Agric. 103	R	Agricultural Seminar Gen. Agric. 103	R
Total	16	Total	16

FIFTH YEAR

Junior year of the Curriculum in Veterinary Medicine

SIXTH YEAR

Senior year of the Curriculum in Veterinary Medicine

Number of semester hours required for graduation, 204

Anatomy and Physiology

Professor Burt
Associate Professor McLeod

This branch of veterinary medicine extends over the freshman and sophomore years for veterinary students, and one semester is required in the curriculum in agriculture.

The classroom instruction consists of lectures, quizzes and recitations and special dissection of the part under discussion, also a study of dissected specimens, various models, and the Azoux model of the horse. Mounted skeletons and limbs, and loose bones are abundant in the museum. The horse is taken as a type and the other domestic animals are compared with the horse. As often as necessary parts of other animals are dissected to show the differences.

The courses in anatomy require several lecture rooms, which contain models, skeletons, and bones of all kinds, and a thoroughly sanitary dissecting room equipped with all the latest materials necessary to give a course in anatomy second to none on the continent.

The equipment for instruction in physiology is ample to give the student a thoroughly comprehensive course of laboratory study.

In addition to numerous atlases and charts furnished by the College, the student is required to have Sisson's *Veterinary Anatomy* as a textbook. A dissecting guide is furnished by the department.

The department owns equipment valued at $8,060.

COURSES IN ANATOMY

FOR UNDERGRADUATE CREDIT

103. Anatomy I. 3(2-3); I*. Dr. McLeod.

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2. All electives must be officially approved before assignment by both the head of the Department of Animal Husbandry and the dean of the Division of Agriculture.

3. The course in Agricultural Relationships is open to seniors only.

* The number before the parenthesis indicates the number of semester hours of credit; the first numeral within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week. I, II and SS indicate that the course is given the first semester, second semester and summer session respectively.

A detailed study of the bones of the horse, and a comparative study of the bones of other domestic animals, and of man. Deposit, $3.

108. Anatomy II. 8(4-12); II. Prerequisite: Anatomy I. Drs. Burt and McLeod.
Myology, arthrology, and splanchnology, or a study of muscles, joints, and viscera. Deposit, $5.

112, 116. Anatomy III and IV. 4(1-9) and 3(1-6) respectively; I and II respectively. Prerequisites: For III, Anatomy II; for IV, III. Dr. Burt.
Distribution, location, and relation of the blood vessels and nerves; all parts not previously dissected; two-thirds of the subject covered in Anatomy III, one-third in Anatomy IV; in Anatomy IV also a comparative study of the principal structural differences of the various domestic animals, not studied concurrently with the previous courses. Deposit, $5 for each course.

FOR GRADUATE AND UNDERGRADUATE CREDIT

202. Special Anatomy. 2 to 4 credits; II. Prerequisite: Any course in Anatomy and Physiology (102, 107, 111, 116, or 131), or equivalent. Dr. Burt.
Study of any part of the horse, as the digestive system, the genital system, etc., or of similar parts of the ox, sheep, pig, etc., or of poultry anatomy; this course being adaptable to the requirements of the line of work in which the student is specializing.

206. Applied Anatomy. 1(0-3); I. Prerequisite: Anatomy IV. Dr. Burt.
Dissection of certain areas embraced in performing the various surgical operations, and study of all the structures in each area and their relation to one another as they would present themselves during an operation.

COURSES IN ANATOMY AND PHYSIOLOGY

FOR UNDERGRADUATE CREDIT

131. Anatomy and Physiology. 3(2-3); I. Drs. Burt and McLeod.
Physiology of the domestic animals with special emphasis on digestion, absorption, metabolism and excretion; sufficient anatomy to give a thorough understanding of the correlation between the two subjects and of the physiologic relations existing among the various organs of the body. Text: Smith, *Manual of Veterinary Physiology*. Charge, $1.

COURSES IN JURISPRUDENCE

FOR UNDERGRADUATE CREDIT

161. Jurisprudence. 1(1-0); I. Dr. Burt.
The veterinarian's legal responsibilities; national and state live-stock laws; quarantine regulations, etc. Text: Hemenway, *Veterinary Law,* also state and federal rules and regulations.

COURSES IN PHYSIOLOGY

FOR GRADUATE AND UNDERGRADUATE CREDIT

215. Problems in Physiology. 3 to 5 cr.; I and II. Prerequisites: Any course in Anatomy and Physiology (131, 221, or 226), or their equivalent. Dr. Burt.
Individual investigational problems in the physiology of digestion, reproduction, endocrin glands, etc.

221. Comparative Physiology I. 5(4-3); I. Prerequisites: For veterinary students, Anatomy I and II and Organic Chemistry (Vet.); for others, an approved course in organic chemistry. Drs. Burt and McLeod.
Physiology of domestic animals and man, beginning with the study of the blood, heart, blood vessels, and continuing with the ductless glands and in-

ternal secretions, respirations, digestion, and absorption. Text: *A Manual of Veterinary Physiology,* by Fred Smith, or *Essentials of Veterinary Physiology,* by Paton and Orr, or any standard textbook on Physiology.

Laboratory.—A practical application of the knowledge derived in the classroom. Laboratory directions furnished the student. References: Pembry, *Practical Physiology;* Halliburton, *Essentials of Chemical Physiology;* Stewart, *Manual of Physiology;* Fish, *Urine of the Horse and Man;* Hawk, *Practical Physiological Chemistry;* and other standard texts on physiology. Deposit, $3.

226. Comparative Physiology II. 3(2-3); II. Prerequisites: Same as for course 221. Drs. Burt and McLeod.

The urine and urinary system, nutrition, animal heat, muscular and nervous systems, locomotion, generation and development, growth and decay. Text: Same as for course 221. Deposit, $3.

Pathology

Professor Lienhardt
Associate Professor Scott
Assistant Professor Kitselman
Instructor Leasure

The Department of Pathology presents courses in histology, pathology and meat inspection. The instruction is presented by lectures or recitations, laboratory periods, and demonstrations which are carried out by the use of the projectoscope and by autopsies.

The laboratory is fully equipped and entirely up to date. The equipment consists of microtomes, paraffin ovens, microphotographic and projection apparatus, centrifuge, shaking machines, sterilizers, etc. Each student is furnished a drawer, microscope, prepared slides for study, and all other essentials needed for study in the laboratory courses.

The department is also in possession of a fairly complete pathological museum, which contains specimens of organs and tissues that show lesions typical of the various infections, and some noninfectious diseases. These specimens are used in the study of pathology, and together with the specimens sent in from over the state and fresh material from the immediate vicinity, they furnish ample material for the course in pathology.

The department library contains text and reference books on pathology and allied subjects, also the current files of the important technical periodicals relating to pathology. These books are at the constant disposal of the student for reference.

The course in meat inspection together with the allied subjects required for a degree in veterinary medicine make the student eligible to take the civil-service examination for meat inspection. In this course visits are made to packing plants in Topeka and Kansas City.

The equipment owned by the department is valued at $14,075.

COURSES IN HISTOLOGY

FOR UNDERGRADUATE CREDIT

102. Histology I. 2(1-3): I. Dr. Leasure.

Care and manipulation of the microscope; microscopical examination of the various tissues previously sectioned and mounted; blood-forming organs, the digestive tract, etc., studied with a microscope and drawn by the student; preparations are teased and many sections in paraffin and celloidin. Text: Stohr, *Histology,* or Bailey, *Histology.* Deposit, $3.

107. Histology II. 4(1-9); II. Prerequisite: Histology I. Dr. Leasure.

Study of the stomachs of the dog, the horse and the ox; the intestines, the liver, pancreas, respiratory tract, the urinary organs, genital organs, the skin and appendages, suprarenal gland, the brain, the eye and the ear; these tissues studied with the microscope, and drawn by the student. Text: Same as course 102. Deposit, $3.

FOR GRADUATE AND UNDERGRADUATE CREDIT

252. Special Histology. 3(1-6); II. Prerequisite: Anat. 131 or its equivalent. Dr. Lienhardt.

A course dealing with special organs, as those concerned with digestion, respiration, etc.; tissues, fixed, dehydrated, imbedded, sectioned, stained, mounted and studied.

COURSES IN PATHOLOGY

FOR GRADUATE AND UNDERGRADUATE CREDIT

202, 207. Pathology I and II. 3(2-3) each; II and I respectively. Prerequisites: For I, History II, and Chem. 107; for II, Path. 107 and 202, Anatomy 226, and Bact. 111, I. Dr. Lienhardt and Leasure.

General pathology, treating of the history of pathology, predisposition, immunity, congenital and inherited disease, cause of disease, course and termination of disease. Text: Delafield and Prudden, *Textbook of Pathology.* Deposit, $3 for each course.

212. Pathology III. 5(4-3); II. Prerequisites: Path. 207, Anat. 116, and Bact. 116. Drs. Lienhardt and Leasure.

Special pathology and pathological technic; collecting, fixing, hardening, embedding in celloidin and paraffin sections of fresh, frozen and embedded tissues; and study of the method of preserving gross specimens. Texts: Delafield and Prudden, *Pathology;* Kitt, *Pathologische Anatomie;* and Adami and Nichols, *Pathology,* vol. II. Deposit, $3.

214. Pathology IV. 3(2-3); I. Prerequisite: Path. 212. Drs. Lienhardt and Leasure.

Pathology of the infectious diseases and laboratory diagnosis. Text: Moore, *Pathology of Infectious Diseases.* Deposit, $2.50.

216. Meat Inspection. 2(2-0); I. Prerequisite: Path. 212. Dr. Kitselman.

Kinds and classes of stock, traffic and transportation of animals, inspection before and after slaughter, disposition of the condemned from economic, hygienic, and sanitary standpoints, and study of different preparations and methods of preservation, adulterations, sanitary laws and regulations, and other points bearing on the question of healthful meat production. Text: Edelmann, *Meat Hygiene,* translated by Mohler and Eichern.

220, 221. Pathological Technic and Diagnosis I and II. 2(0-6) and 4(0-12) respectively; I and II each. Prerequisites: I, Path. 207; II, Path. 212 and 220. Drs. Lienhardt and Leasure.

Practice in post-mortem and laboratory diagnosis. Deposit, $3 for each course.

227, 230. Vaccine Manufacture I and II. 2(1-3) each; I and II each. Prerequisite: Bact. 116. Dr. Scott.

I: Theory and practice of immunization as applied to blackleg and hog cholera.

Laboratory.—Isolation and identification of the blackleg organism and of related anaërobes, and practical production of blackleg biological products and anti-hog-cholera serum and virus. Deposit, $3.

II: Preparation and standardization of various veterinary biological products, such as tuberculin, bacterial vaccines, and bacterins.

Laboratory.—Production of some of the products mentioned and special work on blackleg biological products and anti-hog-cholera serum and virus. Deposit, $3.

FOR GRADUATE CREDIT

302. Research in Pathology. 1 to 10 credits; I and II. Prerequisites: Pathology 214 and 221, Bact. 116 and Chem. 235, or their equivalent. Drs. Lienhardt and Scott.

Individual research problems in pathology of the nervous system, eye, and ear; investigational work on disease caused by a filterable virus. This work may form the basis for a master's thesis. Deposit, $3.

Surgery and Medicine

Professor DYKSTRA
Professor FRICK
Associate Professor MCLEOD
Instructor FRANK

For instruction in surgery and clinics the equipment is excellent. The veterinary hospital, recently completed at a cost of more than $100,000, is equipped with every modern appliance for surgical operations and diagnosis of animal diseases. The hospital has capacity for more than fifty horses or cattle, and in addition, it can accommodate fifty small animals, such as sheep, swine, cats, dogs, etc. In addition to the foregoing, members of the clinical staff, accompanied by students, make trips into the surrounding country to give veterinary attention to ailing patients. In this way the students come in contact every year with the diseases of animals and their treatment. The work is always under the guidance of proficient practitioners.

For the study of materia medica and pharmacy there is a general pharmacy laboratory containing all the drugs used in the practice of veterinary medicine and a practicing pharmacy where medicines are compounded for the everyday practice connected with the College.

This department owns equipment to the value of $3,365.

COURSES IN SURGERY

FOR UNDERGRADUATE CREDIT

101, 106. SURGERY I AND II. 3(3-0) each; I and II respectively. Dr. Dykstra.

I: Methods of restraint; asepsis and antisepsis; anæsthesia, both local and general, inoculation, bandaging, controlling hemorrhage; division of tissues and uniting of wounds; injections of medicines into the subcutaneous tissues, blood streams, trachea, spinal canal; thorough study of animal dentistry.

II: Surgical diseases of the head, neck, thorax, abdomen, stomach and bowels, urinary organs and organs of generation.

111, 116. SURGERY III AND IV. 3(3-0) each; I and II respectively. Dr. Dykstra.

I: Causes, symptoms, and treatment of lameness; fractures and their reduction; diseases of joints, tendons and sheaths, muscles and fascia; surgical diseases of the foot; horse-shoeing.

II: Special operations, such as neurectomies, autoplasties, desmotomies, actual cauterization, tenotomies, myotomies, enterotomy and enteroanastomosis, and surgery of the eye. References: Dollar, *Regional Veterinary Surgery;* Merillat, *Veterinary Surgery,* Vols. I, II and III; Williams, *Surgical Operations;* Fleming, *Operative Veterinary Surgery,* Parts I and II; and White, *Restraint of Domestic Animals.*

121. OPERATIVE SURGERY. 1(0-3); II. Drs. Dykstra and Frank.

More than 100 operations are performed on old horses which have been placed on the operating table and anæsthetized. The student is required to observe a careful technic, such as antisepsis, and, in fact, performs the operation as thoroughly and completely as possible. Charge, $5.

COURSES IN OBSTETRICS

FOR UNDERGRADUATE CREDIT

131. OBSTETRICS. 3(3-0); II. Prerequisites: Anatomy IV and Zoölogy and Embryology (Vet.); or Anatomy and Physiology, and Embryology. Dr. McLeod.

Physiology of pregnancy, principles of breeding, anatomy of the generative organs, care and hygiene of the pregnant animals, sterility, diseases incidental to pregnancy, diseases of new-born animals, care of new born animals, ab-

normal presentation during parturition, surgery of obstetrics, etc. References: Williams, *Veterinary Obstetrics;* Williams, *Surgical and Obstetrical Operations;* DeBruin, *Bovine Obstetrics;* Fleming, *Veterinary Obstetrics;* and Williams. *Diseases of the Genital Organs of the Domestic Animals.*

COURSES IN CLINICS

FOR UNDERGRADUATE CREDIT

137, 140. Clinics I and II. 1(0-6) and 1(0-10) respectively; I and II respectively. Drs. Dykstra, Frick, and Frank.

A free clinic is conducted, at which all species of domesticated animals are presented for treatment. In clinics I and II junior students assist in these treatments, become proficient, by practical experience, in the restraint of animals, in bandaging, etc., and have charge of compounding prescriptions, preparation of antiseptics and other medicinal agents. Deposit, $5 for each course.

143, 146. Clinics III and IV. 1(0-12) each; I and II respectively. Prerequisite: Junior or senior veterinary assignment. Drs. Dykstra, Frick and Frank.

Diagnosis and treatment of hospital patients, including the keeping of clinic sheets, the administering of all medicines, changing of dressings of surgical wounds, etc.; assisting clinicians in out-clinic work. Deposit, $5 for each course.

COURSES IN MATERIA MEDICA

FOR UNDERGRADUATE CREDIT

157. Materia Medica. 4(4-0); I. Dr. Frank.

Modes of action of drugs in general, their method and rapidity of absorption and elimination, physiological and chemical incompatabilities, etc.; origin, physical properties, active constituents, and official preparations of medicinal agents.

163. Therapeutics. 3(3-0); II. Prerequisite: Materia Medica. Dr. Frank.

Physiological and therapeutic action of the various drugs both on the healthy and on the diseased animals; symptoms and treatment of poisons frequently encountered in veterinary practice; the proper dose of the crude drug and its preparation for horses, cows, dogs, cats, and swine.

166. Pharmacy. 1(0-3); I. Dr. Frank.

Meanings of the various pharmaceutical terms; various systems of weights and measures; prescription writing; principles of filtration, percolation, hot-water and sand baths, etc.; preparation of at least one of each of the following: An infusion, a decoction, a tincture, a wine, a syrup, a fluid extract, a liniment, an emulsion, a liquor, an aqua, a spirit, an ointment, an electuary, and a cataplasm; a thorough course in the compounding of prescriptions. Reference work: *U. S. Pharmacopœia;* Maltbie, *Practical Pharmacy;* Remington, *Practive of Pharmacy;* Fish, *Exercises in Materia Medica and Pharmacy.* Deposit, $3.

COURSES IN MEDICINE

FOR UNDERGRADUATE CREDIT

170. Diagnosis. 2(2-0); I. Prerequisites: Anat. and Physiol. 116 and 226. Dr. Frick.

Different diagnostic methods employed for the detection of diseases, including ausculation, percussion, palpation, and inspection; normal and abnormal abdominal and thoracic sounds, including diagnostic inoculations, as an aid to the detection of disease.

174, 177. Diseases of Large Animals I and II. 4(4-0) and 5(5-0) respectively; II and I respectively. Prerequisite: Diagnosis. Dr. Frick.

I: Noninfectious diseases of the respiratory organs of the larger animals.

II: Noninfectious diseases of the mouth, salivary glands, œsophagus, stomach and intestines, liver, pancreas and peritoneum of the larger animals; diseases of the urinary organs, of the circulatory organs, diseases of the metabolism, of the nervous system, of the organs of locomotion, of the skin and of the eye.

181. Infectious Diseases of Large Animals. 5(5-0); II. Dr. Frick.

The distinctly infectious and contagious diseases of the larger domesticated animals.

186. Diseases of Small Animals. 2(2-0); II. Prerequisite: Diagnosis. Dr. Frick.

Infectious and noninfectious canine and feline diseases; breeds of dogs and cats, erection of kennels, the breeding and care of puppies, care and feeding of dogs in general, and the hygienic measures pertaining thereto.

190. Farm Animals in Health and in Disease. 3(2-3); II and SS. Prerequisite: Anatomy and Physiology. Dr. Frank.

First-aid treatment of diseases of domestic animals; special emphasis on cause and prevention of disease in farm animals; domestic animals studied in relation to their surroundings. Text: Craig, *Common Diseases of Farm Animals.*

FOR GRADUATE CREDIT

301. Research in Surgery. 1 to 10 credits; I and II. Prerequisites: Surgery I to IV, Anatomy I to IV, and Therapeutics. Dr. Dykstra.

The purpose of this course is to attempt to solve many of the surgical problems confronting the average veterinary practitioner. Offered especially for graduates in veterinary medicine.

The Division of College Extension

HARRY UMBERGER, *Dean and Director*
L. L. LONGSDORF, *Extension Editor*

The people of Kansas believe in using their educational institutions to their full capacity, not only for the students privileged to come to them, but also for the state at large. They know that the number who complete a College course in agriculture, engineering, or home economics is small in comparison with the great majority of the people who cannot go to college, and it is their wish that this majority also be served. The Agricultural College is in full sympathy with this desire and is ambitious not only to give its resident students the best possible training for leadership in life's work, but to be of direct service to every community of the state.

As far back as 1864 conventions of the farmers of Manhattan and vicinity were held at the College. The first well-organized farmers' institute conducted under the auspices of the Faculty was held at Manhattan, November 14, 1868, and this was followed by a similar gathering at Wabaunsee, November 20 and 21 of the same year. In 1868 the Board of Regents adopted a resolution recommending "that a system of lecturing on agricultural subjects at this College and the populous settlements of the several counties of the state should be conducted, so that the benefits of farming according to correct agricultural principles may be disseminated throughout the state."

A few meetings were held each year for the next several years, increasing in number from 1879, but no definite appropriation for extension work was made until 1899, when $2,000 per year was appropriated for this purpose by the state legislature. The annual appropriation remained at this figure until 1905, when the legislature appropriated $4,000 for the work, to which the College added $800. Up to this time no regular staff for extension work was employed, and all extension activities were conducted by a committee. In October of that year, however, a superintendent to organize the institute work was selected by the Board of Regents, and in July, 1906, the Department of Farmer's Institutes was formally organized.

The interest in extension work throughout the state then developed rapidly. Beginning with 1907 appropriations by the Kansas legislature for extension work in the state have been as follows:

For biennium.	*Amount.*	*For biennium.*	*Amount.*
1907-'09	$10,500	1919-'21	$138,277
1909-'11	52,500	1921-'23	184,289
1911-'13	75,000	1923-'25	165,000
1913-'15	95,000	1925-'27	165,000
1915-'17	41,262	1927-'29	203,683
1917-'19	89,759		

This rapid development of extension work was made possible not only because the people of the state wished to have such work done, but because much new light has been thrown on the essentials in agriculture by the effective experimental work done by the Experiment Stations and by the United States Department of Agriculture.

In 1914 the federal government felt that the useful and practical information on subjects connected with agriculture and home economics developed by the experiment stations, by the Department of Agriculture, and by the experience of the best farmers and farm homes should be made more readily available to everyone; and in order that this information might be more fully and effectively diffused among the people of the several states and its

practical application encouraged, the congress of the United States, in 1914, passed the Smith-Lever bill, which provides for "coöperative agricultural extension work between the agricultural colleges in the several states receiving the benefits of an act of congress approved July 2, 1862, and of acts supplementary thereto, and the United States Department of Agriculture." To further this act the congress provided for an annual appropriation of $480,000, of which $10,000 is paid each year to each state which assents to the provisions of the act. This initial appropriation was increased each year for seven years, such increase being allotted annually to each state in the proportion which the rural population of such state bore to the total rural population of all the states, providing a sum equal to such increase had been appropriated for that year by the legislature of such state, or had otherwise been provided from within the state, for the maintenance of the coöperative agricultural extension work.

Under this act the coöperation of the agricultural colleges and the United States Department of Agriculture has been assured, extension work has become a national as well as state project, and its effectiveness has been greatly increased.

The governor of the state and the Kansas legislature of 1915 accepted the provision of the Smith-Lever act immediately, and $10,000, therefore, was secured from the federal government for extension work for the year ending June 30, 1915, and for each succeeding year thereafter. The additional sums coming from the federal funds under this act to the state for the years ending June 30, 1916 and 1917, respectively, were $14,555 and $26,685; for the years 1918 and 1919, $38,815 and $50,944, respectively; for the years 1920 and 1921, $63,074 and $75,203, respectively; for the years 1922 and 1923, $80,641 and $90,842, respectively; and for each of the years 1924 to 1929, inclusive, $91,842. These sums were duplicated by an equal appropriation by the legislature of Kansas for the years named with the exception of 1924, 1925, 1926 and 1927, for each of which the legislature appropriated $82,500, and for each of the years 1928 and 1929, $101,841. In addition, from the appropriation made to the Agricultural College for all its work, $31,000 was set aside for extension work for the year ending June 30, 1923. During the war congress made an emergency appropriation to extension work, in order that special attention might be given to maximum production of food, conservation and economic utilization of farm products. This appropriation terminated June 30, 1919. There was such great demand for continuation of much of the work started under this appropriation, with a view to carrying it on a more constructive and permanent basis, that congress appropriated funds for this purpose, effective July 1, 1919. This is known as the supplementary federal Smith-Lever appropriation. The total sum for extension work under the Smith-Lever act and from state funds for each of the years ending June 30, 1928 and 1929 was as follows: From the federal government through the Smith-Lever act, $101,841; from the federal government through the supplementary Smith-Lever appropriations, $29,120; from the general state appropriations made to the College, $28,000; and from the state legislature by direct appropriation for Smith-Lever work, $101,841; from county appropriations offsetting the supplementary Smith-Lever appropriation, $29,120; total for each of these years, $289,922.

County funds are appropriated for the support of the county farm bureaus through a special act of the legislature enabling the county commissioners to levy a direct tax for this purpose. (Session Laws of Kansas for 1915, p. 204, ch. 166, sections 1, 2 and 3; Session Laws of Kansas for 1919, p. 217, ch. 157, sections 1, 2 and 3.)

The rapid growth of extension work has demanded efficient administrative machinery. In the judgment of the president of the College and the Board of Regents it became necessary to create, in December, 1912, a Division of College Extension coördinate with the other divisions of the College. This at first was subdivided into four distinct sections or departments, but the increase in work and personnel of the division made necessary a reorganization into eight departments, namely; institutes and extension schools, county-agent work, boys' and girls' club work, home economics, home demon-

stration-agent work, rural engineering, rural service, and home-study service, each with its own head and staff. The department of rural service was discontinued June 30, 1922. The heads of the departments are responsible to the director, who is dean of the Division of College Extension. Through this organization it is possible to administer the extension work effectively and economically, to reach directly more than 500,000 people in the state each year, and to conduct some activity in every county.

Publications covering practical subjects in the field of agriculture, home economics and rural engineering are issued from time to time by the Division of College Extension as bulletins, circulars and leaflets. The authors of these publications are the extension specialists or the specialists of the departments in the other divisions of the College. The regular publications of the Agricultural Experiment Station also are used extensively in the extension work. A series of publications in coöperation with the United States Department of Agriculture is receiving special attention. Extension publications are mailed regularly to a list, composed of members of farm and home institutes, homemakers' clubs, extension schools, and farm bureaus; *i. e.*, to members of organizations coöperating closely with the Agricultural College. Any citizen of the state, however, on request, may secure copies of individual publications.

While the extension work is directed by the Division of College Extension for administrative efficiency, its scope would be limited were it not for the close coöperation of the other divisions and departments of the College, which not only help in supplying lectures for agricultural meetings and extension schools, material for publication, assistance in demonstration work and helpful counsel, but also are responsible for all subject matter taught by the extension specialists.

Beginning in February, 1924, the radio has been used as a means of extending information from the College to those living in distant parts of the state. This service has consisted in the giving of instruction in many subjects both by means of regular courses of lectures in specialized fields and by general discussions of subjects having timely interest to the people of the state.

Institutes and Extension Schools

AGRICULTURAL EXTENSION SPECIALISTS

L. C. Williams, in Charge

L. C. Williams, Horticulture
W. R. Martin, Horticulture
C. G. Elling, Animal Husbandry
J. J. Moxley, Animal Husbandry
J. W. Lumb, Veterinary Medicine
E. G. Kelly, Entomologist
————, Poultry Husbandry
G. T. Klein, Poultry Husbandry
A. E. Oman, Rodent Control
Roy Moore, Rodent Control
————, Dairy Husbandry
Jas. W. Linn, Dairy Husbandry
E. B. Wells, Soils
H. R. Sumner, Crops
L. E. Willoughby, Crops
E. A. Stokdyk, Marketing
I. N. Chapman, Farm Management Demonstrator
C. E. Graves, Plant Pathologist

The Department of Institutes and Extension Schools has direct supervision over farm and home institute organizations, all extension schools in agriculture and home economics, and the work of the agricultural extension specialists. The department also has charge of the program and arrangements for Farm and Home Week, and annual state-wide farmers' meeting, and the scheduling of judges for county and local fairs.

Each farm and home institute of the state is an association or farmers' club, with regular officers, constitution and by-laws. Some organizations hold six or more monthly meetings, and practically all of them have no fewer than three, because no institute organization can obtain state aid unless in addition to the annual meeting, at which some representatives of the College must be present, it also holds at least three local meetings. The College plans to send two specialists to the annual meeting—one in agriculture and one in home economics, to present certain well-defined lessons, and to give the results of

demonstration work for the county or locality. The specialists and their subjects are chosen because of a known need or interest of a particular community or a plan to start or encourage certain definite lines of work.

EXTENSION SCHOOLS

Owing to the nature of the farm and home institutes, the demand for instruction can be met only in part, and for that reason extension schools or short courses in agriculture and home economics have been organized in communities which desire more complete courses in these subjects than can be given at the institutes.

The College now conducts extension schools in agriculture and home economics of from one to five days' duration, sending to each school two or more instructors. Here well-planned, comprehensive courses are given in the various lines of agriculture and home economics, so that some of the essentials of these subjects may be learned. The local committees are required to organize the classes and pay the local expenses for each school. The Agricultural College supplies the teachers and pays their traveling expenses from funds appropriated for this purpose.

In addition to these general schools, special schools in breeding, animal diseases, dairying, poultry, orcharding, road making, tractors and farm machinery, and cement construction are held in communities desiring them and willing to defray the local expenses.

Extension schools are popular where the communities are brought to understand the work given. Almost every community which has had one school has petitioned for another. Each community is now required to submit the names of at least thirty men and twenty women who agree to attend as many sessions of the school as possible. This requirement has increased materially the attendance, interest, and coöperation.

EXTENSION SCHEDULES

The specialists of this department work in extension schools and institutes during the winter months only, and a portion of this time is devoted to cooperative demonstration work in agriculture and home economics. During the spring, summer and fall they conduct special campaigns, such as silo building, poultry culling, wheat improvement, grasshopper control, cow testing, better sires, hog-cholera control, and coöperative demonstration work. The latter phase of the work of the extension specialists is being especially met by the organization of coöperative demonstration work in each branch of agriculture in a certain number of counties each year. In much of the cooperative work each specialist has from 10 to 100 or more coöperators in each county. These men and women work under the direction of the specialist and the county agent. They keep records of the work and call demonstration meetings at their farms on each trip of the specialist. The number of visits which the specialist makes to each point varies from two, in the case of the specialist in soils, to six, in the case of the specialists in horticulture and entomology. The aim in all of this coöperative demonstration work is to show as well as to explain. This line of work is especially appreciated, and the representatives of the department have been able to meet only a fraction of the demands for it.

The extension specialist takes to the farm and farm home the newest research work of the Agricultural Experiment Station and the United States Department of Agriculture in a practical, effective and usable form. He is also of material assistance to the Agricultural Experiment Station of the College and to the United State Department of Agriculture in reporting the progress and success of demonstration work in the field. He seldom makes a trip without coming in contact with new agricultural problems or old ones requiring the attention of the research workers of the Agricultural Experiment Station. By working in the closest coöperation with the subject-matter department of the College, the specialists become the carriers of information,

not only from the Agricultural Experiment Station to the farmers, but from the farmers to the research workers of the Experiment Station. The extension specialist is, therefore, a medium through which both the Agricultural Experiment Station and the farmers can function to their mutual advantage.

To reach all of the people of the state, the work of the specialist becomes largely a matter of teaching and training leaders, such as the county agents, the home demonstration agents, the boys' and girls' club agents, and project leaders. If they are successful in teaching these leaders how to carry forward their various projects they are most efficient in carrying their message to all the farmers in the state. The specialists, therefore, are becoming more and more each year teachers of leaders instead of public speakers at general farmers' meetings as they were in times past.

Through these various leaders a definite check is kept regarding cost of production, need of follow-up work, and the progress made in the demonstration work undertaken. Haphazard, hit-and-miss extension work, therefore, has no place in our program under the present system.

The calls for extension specialists in all lines of work are so many that it is impossible to meet more than two-thirds of calls for assistance from county agricultural agents and from farmers' organizations. The number of specialists is being increased rapidly, yet the work is growing still more rapidly, thus indicating a healthy condition.

FARM-MANAGEMENT DEMONSTRATIONS

Farm-management demonstrations are conducted by a farm-management specialist in coöperation with the county agents. In these demonstrations such records are taken as are essential to the determination of the net profits of the individual farms. These records are classified according to different types of farming, the profits of each type are determined, and individual farm records are compared with the average of all the farm records taken. The results of the study are made known to each farmer interested, in order that he may use the suggestions received in any need or reorganization of his own business. For those who desire it, farm account books are opened and instruction is briefly given in keeping simple records. The work was begun in September, 1914. The demand for this work was greatly increased by the enactment of the income-tax law, and the resulting need of business records by which the income might be determined, and by the demand for accurate cost-of-production figures by price-fixing commissions.

COUNTY AND LOCAL FAIRS

The animal husbandry and crop specialists devote from one to two months in judging the live stock and agricultural products at county and local fairs, which furnish an excellent opportunity for lectures and demonstration work. Large numbers of people are reached through the fair judging work. In many cases people become interested in the work of the specialists who have not been interested or reached through farmers' meetings and demonstrations. Each specialist endeavors to make his judging work as practical and instructive as possible.

FARM AND HOME WEEK

The purpose of Farm and Home Week is to interest the farmers of the state in better methods of production and of farm management that will increase farm profits, to demonstrate to farm women methods of household management that will add to the comfort and enjoyment of farm life, and to encourage farm folks in social organization that will enrich the social life of the rural community.

All meetings, lectures and demonstrations during Farm and Home Week are free of charge, and the expense of the trip to Manhattan with reduced railroad rates, should not prevent any farmer from attending. The investment in knowledge and enthusiasm will make bigger profits on the farm.

During this week the College Experiment Station, the Extension Service, the United States Department of Agriculture, agricultural specialists and leading farmers bring to those in attendance the latest results in investigative work in all lines or agriculture, home economics and mechanical engineering.

Problems concerning crops and soils, dairying, beef cattle, horses, hogs, sheep, poultry, horticulture, community service, beekeeping, and diseases of animals are discussed by some of the leading agricultural authorities in America. In addition to these lectures and demonstrations there are many other interesting features, such as the display of the live stock of the College, the barns, machinery, buildings, libraries, museums, dairy, experimental plots, orchards and gardens.

County Agent Work*

H. Umberger, Dean and Director
A. L. Clapp, District Agent
G. W. Salisbury, District Agent
Frank O. Blecha, District Agent
A. F. Turner, Field Agent

Roy E. Gwin, Allen
J. A. Hendriks, Anderson
Joe M. Goodwin, Atchison
R. E. Williams, Barton
T. F. Yost, Bourbon
W. H. Atzenweiler, Brown
Chas. E. Cassel, Butler
C. F. Gladfelter, Chase
H. L. Gibson, Cherokee
M. C. Kirkwood, Cheyenne
R. R. McFadden, Clark
C. R. Jaccard, Clay
L. F. Neff, Cloud
E. A. Cleavinger, Coffey
Fred J. Sykes, Comanche
W. L. Tayloe, Crawford
A. E. Jones, Dickinson
Chas. E. Lyness, Doniphan
A. I. Gilkison, Douglas
O. R. Caldwell, Finney
Harry C. Baird, Ford
F. Joe Robbins, Franklin
Paul Gwin, Geary
J. H. Coolidge, Gray
J. W. Farmer, Greenwood
E. H. Aicher, Harper
Ray L. Graves, Harvey
Geo. S. Atwood, Hodgeman
H. F. Tagge, Jackson
Duke D. Brown, Jefferson
R. P. Ramsey, Jewell
C. A. Jones, Johnson
W. S. Speer, Kingman
W. C. Farner, Labette
E. H. Leker, Leavenworth
R. L. Stover, Lincoln
W. J. Daly, Linn
Carl Howard, Lyon
M. L. Robinson, McPherson
J. D. Montague, Marion
W. O'Connell, Marshall
John H. Shirkey, Meade
J. T. Whetzel, Miami
A. W. Knott, Montgomery
D. Z. McCormick, Morris
G. M. Reed, Nemaha
L. N. Jewett, Neosho
Geo. W. Sidwell, Ness
E. L. McIntosh, Osage
Robt. E. Curtis, Ottawa
A. C. Hoffman, Pawnee
Chas. H. Stinson, Pratt
E. F. Carr, Rawlins
C. M. Carlson, Reno
S. D. Capper, Riley
W. H. von Trebra, Rice
D. E. Hull, Saline
H. L. Hildwein, Sedgwick
W. H. Robinson, Shawnee
Neil L. Rucker, Sherman
A. B. Kimball, Smith
L. M. Knight, Sumner
John V. Hepler, Washington
C. E. Agnew, Wilson
R. L. von Trebra, Wyandotte

County-agent work in this state is provided for by the federal Smith-Lever act and the state farm-bureau law. The federal Smith-Lever act provides an appropriation which increased each year until 1922 when it reached its maximum and which is distributed among the states according to their rural population. In addition to the regular Smith-Lever appropriations, Kansas receives additional funds from the so-called supplementary Smith-Lever appropriation. This appropriation was made available immediately following the war period in order that permanent work which had been established during the war period need not be discontinued due to the inability of the regular Smith-Lever appropriations to finance it. Before the federal funds are available they must be duplicated within the state.

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* The United States Department of Agriculture coöperates in furnishing part of the salary of every member of this department. In the case of the county agents, counties, through farm bureaus, furnish a part of the salary and all expenses.

The state legislature appropriates at each session an amount approximately equal to that available to this state from the federal Smith-Lever appropriation. In addition to this, the state farm-bureau law, effective June 17, 1919, provides that when one-fourth, or as many as 250, of the *bona fide* farmers of a county shall form a farm-bureau organization, adopt a constitution and by-laws and elect officers, and when an equipment fund of at least $800 has been provided and deposited in a local bank, the county commissioners shall appropriate at least $1,200 per year (which sum may be raised by a special tax levy), and the Agricultural College shall appropriate at least $1,200, so long as funds are available from the state or federal funds above mentioned, for the purpose of hiring a county agent or agents and paying their expenses.

Previous to 1914 county agents were financed by membership dues, private subscription and a small state appropriation. At that time a membership of at least 100, each paying dues of $5, was required. In 1914, congress passed the Smith-Lever act and in 1915 the Kansas legislature passed the farm-bureau law, which has since been the basis of the extension of this work. During the war period, July 1, 1917, to June 30, 1919, supplemental agricultural appropriations were made by congress for more rapid extension of county-agent work.

August 1, 1912, the first county agent in Kansas was employed by the Leavenworth county farm bureau. The number has increased gradually, until at the present time, January 1, 1928, there are sixty-five active farm bureaus in Kansas, as follows:

Allen	Doniphan	Labette	Ottawa
Anderson	Douglas	Leavenworth	Pawnee
Atchison	Finney	Lincoln	Pratt
Barton	Ford	Linn	Rawlins
Bourbon	Franklin	Lyon	Reno
Brown	Geary	McPherson	Rice
Butler	Gray	Marion	Riley
Chase	Greenwood	Marshall	Saline
Cherokee	Harper	Meade	Sedgwick
Cheyenne	Harvey	Miami	Shawnee
Clark	Hodgeman	Montgomery	Sherman
Clay	Jackson	Morris	Smith
Cloud	Jefferson	Nemaha	Sumner
Coffey	Jewell	Neosho	Washington
Comanche	Johnson	Ness	Wilson
Crawford	Kingman	Osage	Wyandotte
Dickinson			

The county agents are active in conducting demonstrations in the best methods of production and marketing, in assisting farmers with suggestions and plans relative to farm management and the farm business, and in organizing rural activities. Field demonstrations are conducted for the purpose of introducing crops and testing relative value of varieties already grown, and methods of cultivation and harvesting. Proper methods of the feeding, care and management of live stock, of controlling insects and live stock and plant diseases are among the most popular demonstrations. Surveys of the farm business are made in order to study the conditions prevailing in typical areas, and possible improvements in farm-management methods that should be instituted. Improved methods of marketing and community welfare, in which better social relations are fostered, also are important features of this work. The county agent interests himself in practically every farm activity, especially where there is need of improvement.

A course suggesting special lines of training for those desiring to enter extension work will be found elsewhere in this catalogue.

Home Economics

Miss Amy Kelly, State Home Demonstration Leader, in Charge
Miss Mary A. Worcester, Assistant, in Charge of Specialists

Miss Loretta McElmurry, Clothing
Miss Mary Worcester, Clothing
Miss Maude Deely, Millinery
Miss W. Pearl Martin, Home Health and Sanitation
Miss May Miles, Household Management
Miss Conie Foote, Foods and Nutrition
Miss Georgiana H. Smurthwaite, Foods and Nutrition

There are approximately eight hundred women who annually receive instruction in home economics at the Kansas State Agricultural College, and there are several thousand throughout the state who have had the advantages of resident instruction either in this or some other institution. While this is true, the number is small when compared to the great majority of women and girls in the state to whom the work has not been available. To give as much assistance as possible to this vast majority of women is the aim of the Department of Home Economics Extension, and with this in view seven specialists were regularly employed part time during the last year.

The Extension work in home economics is carried on by means of definitely organized programs of work carried on throughout the year through the agency of the County Farm Bureaus, the instruction being given by the specialists and Home Demonstration Agents to local leaders who in turn pass it on to the women in their respective communities.

Home Demonstration Agent Work

Miss Amy Kelly, State Home Demonstration Leader
Miss Ellen M. Batchelor, Assistant State Leader

Mrs Florence D. Syverud, Allen County
Miss Grace Herr, Bourbon County
Miss Nora Bare, Butler County
Miss Mary Border, Cherokee County
Miss Nellie Bare, Clay County
Miss Elizabeth Randall, Douglas County
Miss Edith Holmberg, Ford County
Miss Ella Meyer, Franklin County
Miss Glyde Anderson, Greenwood County
Miss Charlotte Biester, Johnson County
Miss Leona Peterson, Kingman County
Miss Christie Hepler, Labette County
Miss Winifred Edwards, Leavenworth County
Miss Vernetta Fairbairn, Montgomery County
Miss Sara Jane Patton, Neosho County
Mrs. Mary D. Ziegler, Pratt County
Miss Esther Mae Huyck, Rawlins County
Miss Mabel McComb, Reno County
Miss Lois Holderbaum, Shawnee County
Mrs. Laura I. Winter, Sedgwick County
Miss Helen F. Northrup, Wyandotte County

Home demonstration work was made possible in August, 1917, through the passage by congress of the emergency bill. This bill provided funds for the employment of county home demonstration agents. These agents were called emergency home demonstration agents. Before the end of a year there were twenty-five of these agents in the state. The emergency fund was discontinued June 30, 1919.

In the early days the work of the emergency home demonstration agents was instituted under the auspices of city or county organizations, but after following this plan for a short time it was found that it would be advantageous to defer the placing of a home demonstration agent until the counties were properly organized for this specific purpose.

Since August, 1918, farm-bureau counties which have requested home demonstration agents have been organized on the basis of an ideal farm bureau; that is, the women have been taken into the farm bureau as regular members, having all the rights and privileges, and have become part of the working organization. In such counties the work of the home demonstration agents is taken up as part of the regular extension program, which includes the development of farm activities, home activities, and community activities. There are eighteen counties organized with an extension program which includes the work of the home demonstration agent.

The program of work for the home demonstration agent is based on the needs of the communities in the county and is evolved through the community and committee meetings. To-day each county has a county program of work based on the needs of the communities in the county, and this is a part of the state program. The home demonstration agent, in coöperation with the Agricultural College and United States Department of Agriculture, works to carry out the community, county and state program.

Since July 1, 1921, the counties desiring a home demonstration agent are required to meet the following conditions:

1. Supply an office equipped for work, and adequate stenographic help.
2. Provide a fund of not less than $500 for the purchase of equipment in addition to that provided for the county agent.
3. Provide a membership of not less than 100 farm women, each of whom pays at least $1 membership fee into the county farm bureau and has all the privileges and duties of a *bona fide* member. Effective July 1, 1928, the number of women members required is raised to 250.
4. Secure a total county appropriation of not less than $2,400 to the county farm bureau for the salary and expenses of the county agent and the home demonstration agent.

Boys' and Girls' 4-H Club Work

M. H. Coe, State Club Leader
Edna Bender, Assistant State Club Leader
A. J. Schoth, Assistant State Club Leader

Boys' and girls' 4-H club work is one of the very important phases of Agricultural College extension service. Clubs are organized and conducted in cooperation with farm bureaus, farmers' institutes, business men's organizations, and other interested groups or individuals. Through these clubs the College is able to reach and serve a large class of young people which it could neither reach nor serve in any other way. A large number of boys and girls receive an incentive for higher training in agriculture and home economics and gain their first acquaintance with the College through 4-H club work. Boys and girls receive frequent visits from the county extension agents and written material is prepared by the College specialists, and sent out by the state club leader, giving the members definite information regarding farm and home practices recommended by the College.

The project which each club member selects is a fundamental characteristic of 4-H club work. This project is a substantial piece of work designed to show some better practices on the farm or in the home. The club member keeps a careful record of results, follows instructions that are given to him, and explains the work to others. At the end of the year he makes a final report upon the entire year's project and all points related to the same. Fifteen projects are offered to 4-H club members in Kansas as follows: beef, swine, sheep, dairy, poultry, colt, sorghum, corn, garden, potato, clothing, food preparation, food preservation, supper and room improvement. New projects are being added as fast as interests warrant the same.

In interesting boys and girls in 4-H club work, projects are selected which meet, to some extent, at least, the farm and home problems within a community. For example, in communities badly infested with round worms in hogs the boys are urged to join sow and litter clubs and raise worm-free litters. This serves as a demonstration to the community in the importance of better swine management and the club member thus feels that he is doing a worthwhile and needed piece of work and that his efforts are of importance.

4-H club work is available to all boys and girls between the ages of 10 and 20 years, inclusive. The members are organized into clubs varying in size from five or less to fifty or more. In rare instances some clubs reach a membership of over a hundred, though perhaps the average size of the clubs is somewhere between ten and twenty members. These clubs elect their own officers, which consist of a president, vice president, secretary-treasurer, and

club reporter, together with any other officers they may desire. Each club has at least one adult leader. In clubs that are especially large it is possible that each project represented may have a leader. The clubs meet from time to time, conduct their meetings along parliamentary lines, have a program in which the project of their respective lines of work is presented and discussed, give demonstrations, sing songs, play games, practice yells, and carry on like matters of interest to young people.

All of the boys and girls of one community interested in club work are organized into one club organization, even though they may vary in the selection of their projects; thus a community club may contain a certain number of members enrolled in baby-beef work, others in pig-club work, and the girls may be enrolled in poultry, clothing, or other lines of home-economics work. It is preferable that the members of a club unite on the selection of a few projects rather than to have too wide a variation of projects within a club; however, all of the fifteen projects previously mentioned are available for either boys or girls, there being no line drawn between boys' and girls' work.

The very essence of club work is its voluntary nature. Certain minimum requirements are specified which include age of club members, the keeping of records, the conducting of a project, and the attendance at club meetings, etc., but aside from these requirements the work is purely voluntary, and no systematic course of instruction is attempted. Each member is given suggestions as to best methods of handling his project, but whether or not he adopts these mthods is left to his own volition. Ownership is an essential characteristic of club work which centers around living things like growing of plants or animals, or concerned with the active processes of home making, or other matters relating directly to the daily life of the farm and the farm home. As previously indicated, the study of books is incidental and supplemental to the actual work of the project. Club work is learning by doing.

Leadership is another very essential characteristic of 4-H club work. This is of two types; the first being the adult leaders who supervise the club activities and the projects selected by the members. These leaders are usually experienced men or women or older club members who are trained by the extension agents and who know how the thing ought to be done and can tell the members something of the reason why. The other type of leadership, which is assuming greater importance as time goes on, is that which is developed in club members as a result of their club experience. This is one of the splendid products of club work. Boys and girls who several years ago were members of 4-H clubs are now taking their place as young men and young women who are known as leaders for the best things in agriculture and in the home, and in life in general.

Not only is it essential that 4-H club members learn to do by doing, but they are expected to pass on this knowledge and information to others. Therefore, many club members are trained to put on demonstrations and explain their work to the public. They are expected to exhibit at least some of their products which they have grown or made at the local, county, and state fairs, and those who have attended these fairs in Kansas during the last few years will recall that club members have made remarkable exhibits, not only as regards quantity, but quality as well.

The records which the club members have kept throughout the year in regard to time spent, materials used, costs, etc., form a part of these exhibits, and any prizes which are awarded come as a result of the record which has been kept as well as the excellence of the product itself. Members are trained how to judge quality of such exhibits, and at the time of fairs judging contests are held to determine who has become the best judge. In a similar way demonstration team contests are held to determine what club members have become most proficient in telling others of the things they have learned. Thus, it can be seen that 4-H club work is an educational process, dealing not so much with books as with the things out of which books are made.

Interspersed with all of these essentials of club work are the so-called club

activities, which include club tours, club contests, field meetings, festivals, annual club round-up at Manhattan, 4-H club camps during the summer, and similar club functions, which lend color to the work for the young people and bring them in contact with their leaders and the leaders of other clubs. These activities put them in rivalry and contests not only among themselves, but with the members from the rest of their county and from the entire state. This "rubbing of elbows" brings them a wholesome contact which helps to develop and broaden their ideals and ambitions. All of these various contacts with men and problems, and the affairs of life, serve to awaken youth and stimulate the desire to do and accomplish. Thus, by means of these splendid plans and activities and through the recognition of worthwhile and lasting achievements which 4-H club boys and girls are making in the common and ordinary business of the farm and the home, real progressive, sane agricultural leadership is being developed which may be translated in terms of a progressive, intelligent, and happy citizenship for the future.

Rural Engineering

Walter G. Ward, Extension Architect, in Charge
Claude K. Shedd, Extension Engineer

At one time the person who failed at other occupations could take up farming, as a last resort, and still manage to live. That time has passed. The modern farm is equipped with power machinery, a water system, a lighting system, a sewerage system, up-to-date buildings, and a shop. The installation and maintenance of this equipment require a considerable knowledge of engineering. It is the duty of the Department of Rural Engineering to disseminate this engineering information and to render all the assistance possible to farmers in the solution of their engineering problems.

The extension engineer offers suggestions and assistance in the solution of the drainage, irrigation, machinery, water-supply, and sewage-disposal problems. Field visits and surveys are made from which plans and specifications are prepared and a written report submitted. Copies of these reports are placed on file in the county agents' offices, and these reports are used many times as patterns in other engineering problems of a like nature. By this and other means a general campaign of rural engineering education is carried on.

Owing to the fact that each year a considerable portion of the farm buildings of Kansas need replacing or remodeling, and due to the increased costs of labor and the necessity for farm buildings to be more efficiently located, the opportunity is presented to arrange the farmstead and buildings more conveniently. The extension architect offers assistance with the planning of the farmstead, the farm buildings, the water and sewerage systems, and many related conveniences. A number of farm building plans and specifications, with particular reference to Kansas conditions, have been prepared. These plans are furnished to any one interested, at the cost of blue-printing.

The engineers of this department answer thousands of mail inquiries of an engineering nature each year, and furnish hundreds of small sketches showing how particular engineering problems can be solved. The services of the engineers of this department are free except when requests are made for special trips. Then a charge of travel and local expenses is made.

Home-Study Service

CORRESPONDENCE STUDY

GEORGE GEMMELL, Head of Department
GEORGE MONTGOMERY, Animal Husbandry
B. H. FLEENOR, Education
FLOYD PATTISON, Industrial Subjects
ADA BILLINGS, History and Civics
MARCIA HALL, English
EARL LITWILLER, Horticulture
————, Home Economics

NOTE.—The faculty members employed in the Home-study Service devote their entire time to the work of teaching by correspondence. They keep in close touch with the various departments of the College, and all credit courses which are offered by correspondence must first meet the requirements of the regular College departments handling the courses in residence.

THE PURPOSE OF THE HOME-STUDY SERVICE

There are many people in Kansas and elsewhere who for many reasons cannot attend classes on the college campus, or are past the time when this would be advisable, but who can use the facilities of the college to great advantage. The Home-study Service is a part of the Extension Division of the Kansas State Agricultural College, designed to make the state its campus—to enable the College to come to those who cannot come to it.

Once it was thought that educational problems could be solved only in the classroom, where subject matter was chosen from a textbook. To-day it is realized that the home, the farm, and the shop are calling continually for the solution of problems upon which the future of the people of the state depends. A barren soil, an unprofitable herd, an insanitary home, and kitchen wastes are but petty examples of the innumerable difficulties to be overcome. Years of experience and observation have enabled many to solve their problems with some degree of success, but the lack of scientific knowledge is responsible for many individuals experimenting extravagantly and often uselessly. A combination of experience and training in scientific methods is best.

One way of meeting these situations is through correspondence courses. They are no longer an experiment, but are a demonstrated success. With them odd hours of spare time may be made to count. The gross time required to complete correspondence courses is practically the same as would be necessary for the same courses in school. Correspondence courses may be started at any time. They wait when one is busy. They are instantly ready when one has time. In fact, they are "made to order" for the busy person.

FOR WHOM INTENDED

Though credit courses offered by the Home-study Service are still limited, the number is steadily growing, and it is the purpose of the department to add courses whenever a demand for them becomes evident. The following groups in particular should profit by the courses offered:

1. Those who have completed a common school course, but who for any reason are unable to attend high school.
2. High school graduates temporarily or permanently unable to attend college.
3. Students who for any reason have fallen behind in their work and wish to use their spare time catching up.
4. Students whose attendance at high school or college has been interrupted.
5. The strong, aggressive student who does not wish to halt his progress for vacation and other interruptions.
6. High school and grade classes in practical courses that need supplementing and enrichment.
7. Teachers who wish further professional or other training or who need help in planning and conducting their work.
8. Professional and business men who wish to keep growing along some line of interest, industrial or avocational.
9. Clubs and other organizations that wish to make systematic studies.
10. Men and women who wish effective help in meeting the demands of their vocations for technical and scientific knowledge and training.

HOW THE WORK IS CONDUCTED

In correspondence courses the assignment usually takes the form of assigned readings, studies and investigations, together with a list of questions and directions for a written report. To save postage and trouble in mailing numerous lessons, the correspondence lesson is usually much longer than the common lesson in resident class work. When necessary, the lessons may be accompanied by a lecture prepared by the instructor containing helpful outlines and explanations, additional subject matter, and such special directions as seem desirable. The lessons are modified from time to time as suggested by experience and as new information becomes available.

As soon as an enrollment card and fee are received at the Department of Home-study Service, the first assignments are immediately sent out. As reports are received additional assignments are mailed. This plan keeps work always at hand for the student and at the same time makes it possible for the instructor to keep in close touch with the student's progress and to offer from time to time such suggestions as seem desirable to guide the student in his work. As a rule, the student should make careful study of the corrections, comments, and suggestions upon receiving a returned paper before going further with succeeding lessons.

The progress made by the student depends entirely upon his ability, preparedness, and application. As a general suggestion, it might be stated that an hour a day spent in systematic study should enable the average student to complete an assignment a week. Students may work more rapidly if their opportunities permit. Lessons will be received as rapidly as is consistent with good work, providing not more than eight assignments are sent in one week. Under no circumstances will hastily prepared manuscripts showing superficial knowledge be accepted.

The questions accompanying each assignment are intended to help the student to a better understanding of the subject. After careful study of the assignment, the student should write his manuscript, answering the questions carefully and concisely. This manuscript should be mailed at once to the Department of Home-study Service, where all lesson papers are read carefully, criticized, marked, and returned to the student with such comments, suggestions, advice, and additional references as may be deemed necessary. This plan is continued throughout the course, and each student should feel free to ask questions, relate his personal experience, and in every way possible get into close contact with his instructors. No effort is spared by the department to bring about the nearest possible approach to personal acquaintanceship between each instructor and his students.

EXAMINATION

At the close of each course, before a grade is issued, a final examination is necessary. This final examination may be taken in the office of the Department of Home-study Service at the College, or other arrangements may be made by the student to take it locally under the city or county superintendent of schools or the principal of the local high school. In the latter case, the examination questions and instructions for conducting the examination are mailed from the department to the examiner, and the students' paper is sent in by him.

FEES

The enrollment fee for credit courses is $12.50 a year. This rate applies to all residents of Kansas. (The fee required of nonresidents of the state is $17.50 a year.) Those who may be only temporarily employed outside of the state may enroll for the regular $12.50 fee provided they still claim their citizenship in Kansas. Enrollment cannot be transferred from one student to another.

If a student's work is interrupted by protracted illness or other good reason, he may by special arrangements secure an extension of his enrollment period without payment of further dues. All such cases must be handled individually.

Each student is expected to pay the postage on lessons, manuscripts, and communications sent in to the department. This office will furnish postage for the return of all such papers to the student.

This enrollment entitles the student to as much work as can be satisfactorily completed in one year, not to exceed eight semester hours of college work or three semester credits of high school work, unless work is of a very high character, in which event special arrangements may be made for a limited amount of additional work.

REGULATIONS

1. Enrollments for correspondence-study work will be recived at any time during the year, and students may continue their work uninterruptedly throughout the entire year.
2. Correspondence students will be expected to complete any course for which they are enrolled within twelve months from date of enrollment.
3. Not more than two courses are advised by correspondence at any one time. It is recommended that a student carry but one subject at a time, particularly where only part of the time is given to the work.
4. Each subject listed under the various departments constitutes what is known as a correspondence "course."
5. Students enrolling for correspondence courses must meet the prerequisites the same as if undertaking the work in residence.
6. A student may not be enrolled for correspondence work while in attendance at any institution of learning without special permission from the dean or proper authorities in the institution of which he is a student.
7. No correspondence student shall be permitted to complete a three-hour course in less than three weeks; a two-hour course in less than two weeks; a one-hour course in less than one week.
8. A student enrolled for resident work in College, who enrolls in a subject by correspondence, shall be required to take an examination after each eighth lesson before proceeding with the course; *i. e.,* after the eighth, the sixteenth, and the twenty-fourth lessons, respectively.
9. Where there is evidence of any correspondence student copying any part of the lessons from the papers of another student who has previously taken the course, such student is to be automatically and permanently dropped from the course and a failing grade is to be sent to the registrar's office with notation of cause.

HIGH-SCHOOL COURSES

(College Entrance Credit Work)

In offering the following work for high-school credit, there is no intention of competing with high schools of the state. It is not the purpose of those who have planned the work to present a full four-year high-school course. Students who have opportunity to attend local high school should by all means take advantage of the opportunity, for in such attendance they will have the benefits to be derived from association with fellow students as well as many other advantages which will be helpful to immature students of high school age.

These courses are offered as an aid to those who may by necessity be temporarily out of high school, who may not find the work which they desire offered locally, or who wish to carry work for high-school credit during vacation periods. It is not to be expected that a student can progress as rapidly by correspondence-study methods as he can by devoting his full time to his work when attending high school. Any student who completes a half year of high school work in a year by correspondence may feel that he has done exceedingly well.

The high-school courses will be especially advantageous to prospective college students who have entrance deficiencies and to public school teachers who may not have had the opportunity to do this type of work. No effort has

been spared to make the work as nearly as possible parallel with the courses offered by the accredited high schools of the state. The same textbooks have been used wherever feasible, and the credits issued by this department are recognized by the colleges and State Board of Education.

List of High-school Courses

AGRICULTURE

Course No.		*Number of assignments*	*Unit H. S. credit*
PCA 1.	Elementary Agriculture I	20	½
PCA 2.	Elementary Agriculture II	20	½

DRAWING

PCD 3.	Shop Mechanical Drawing I	20	½
PCD 4.	Shop Mechanical Drawing II	20	½

ENGLISH

PCE 1C.	Grammar and Composition (first year)	20	½
PCE 2L.	Literature (first year)	20	½
PCE 3C.	Composition (second year)	20	½
PCE 4L.	Literature (second year)	20	½
PCE 5C.	Composition (third year)	20	½
PCE 6L.	Literature (third year)	20	½

HISTORY AND CIVICS

PCH 1.	Ancient History I	20	½
PCH 2.	Ancient History II	20	½
PCH 3.	Modern History I	20	½
PCH 4.	Modern History II	20	½
PCH 5.	American History I	20	½
PCH 6.	American History II	20	½
PCH 7.	Community Civics	20	½
PCH 8A.	Civics	20	½
PCH 8.	Constitution of United States	20	½
PCH 9.	World History I	20	½
PCH 10.	World History II	20	½

MATHEMATICS

PCM 1.	Algebra I	20	½
PCM 2.	Algebra II	20	½
PCM 3.	Algebra III	20	½
PCM 4.	Plane Geometry I	20	½
PCM 5.	Plane Geometry II	20	½
PCM 6.	Solid Geometry	20	½
PCM 7.	Bookkeeping	20	½

SCIENCE

PCS 1.	Physical Geography	20	½
PCS 2.	Botany	20	½
PCS 4.	Physiology	20	½
PCS 5.	General Science	20	½
PCC 1.	Commercial Geography	20	½
PCC 2.	Elementary Economics	20	½

College Credit Courses

DIVISION OF AGRICULTURE

AGRONOMY

		Semester credits	*Assignments*
CA 3.	Farm Crops	3	24

ANIMAL HUSBANDRY

CL 2.	History of Breeds	2	16

HORTICULTURE

CH 1.	Elements of Horticulture	3	24
CH 2.	Vegetable Gardening	2	16
CH 3.	Floriculture	2	16
CH 5.	Landscape Gardening	1	8
CH 6.	Small Fruits	2	16

POULTRY HUSBANDRY

CPP 1.	Farm Poultry Production	1	8

DIVISION OF ENGINEERING

		Semester credits	*Assignments*
	MACHINE DESIGN		
CE 2.	Engineering Drawing	2	16
CE 6.	Machine Drawing I	2	16
CE 4.	Mechanism	3	24
CE 11.	Descriptive Geometry	2	20
	CIVIL ENGINEERING		
CE 1.	Highway Engineering I	2	16
	SHOP PRACTICE		
CE 7.	Metallurgy	2	16
	AGRICULTURAL ENGINEERING		
CE 3.	Gas Engines and Tractors	2	16
	MECHANICAL ENGINEERING		
CE 9.	Steam Turbines	3	24
CE 10.	Essentials of Steam and Gas Power Engineering	2	16

DIVISION OF HOME ECONOMICS

	CLOTHING AND TEXTILES		
CHE 1.	Textiles	2	16
	HOUSEHOLD ECONOMICS		
CHE 3.	Sanitation and Public Health	3	24

DIVISION OF GENERAL SCIENCE

	ECONOMICS AND SOCIOLOGY		
CEc 1.	Economics	3	24
CS 2.	Rural Sociology	3	24
CS 3.	Sociology	3	24
	EDUCATION (PROFESSIONAL)		
CP 2.	Educational Psychology	3	24
CP 3.	Educational Sociology	3	24
CP 4.	History of Education	3	24
CP 5.	School Management	3	24
CP 6G.	Methods of Teaching in Elementary Graded Schools and Rural Schools	3	24
CP 6H.	Methods of Teaching in the High School	3	24
CP 7.	Educational Administration	3	24
CP 8.	Psychology	3	24
CP 12.	Home Economics Education	3	24
CP 14.	Vocational Education	3	24
	ENGLISH		
CCE 1.	College Rhetoric I	3	24
CCE 2.	College Rhetoric II	3	24
CCE 3.	Commercial Correspondence	3	24
CCE 4.	The Short Story	3	24
CCE 6.	English Literature I	3	24
CCE 7.	American Literature	3	24
	JOURNALISM		
CCJ 1.	Agricultural Journalism	3	24
	GEOLOGY		
CG 1.	Geology	3	24
	HISTORY AND CIVICS		
CHC 1.	Community Civics	2	16
CHC 2.	Modern Europe I	3	24
CHC 4.	English History	3	24
CHC 5.	Medieval History	3	24
	MATHEMATICS		
CM 7.	Plane Trigonometry	3	25
CM 8.	College Algebra	3	25

The Agricultural Experiment Station

The Kansas Agricultural Experiment Station was organized under the provisions of an act of congress, approved March 2, 1887, which is commonly known as the "Hatch act," and is officially designated as—

"An act to establish agricultural experiment stations in connection with the colleges established in the several states under the provisions of an act approved July 2, 1862, and the acts supplementary thereto."

The wide scope and far-reaching purposes of this act are best comprehended by an extract from the body of the measure itself, in which the objects of its enactment are stated as being—

"To aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and practice of agricultural science."

The law specifies in detail—

"That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and waters; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses for forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable."

On the day after the Hatch act had received the signature of the President, the legislature of Kansas, being then in session, passed a resolution, dated March 3, 1887, accepting the conditions of the measure, and vesting the responsibility of carrying out its provisions in the Board of Regents of the Kansas State Agricultural College.

Until 1908 the expenses of the Agricultural Experiment Station were provided for entirely by the federal government. The original creative act (the Hatch act) carried an annual congressional appropriation of $15,000. No further addition to this amount was made until the passage of the Adams act, which was approved by the President March 16, 1906. This measure provided, "for the more complete endowment and maintenance of agricultural experiment stations," a sum beginning with $5,000, and increasing each year by $2,000 over the preceding year for five years, since which time the annual appropriation has been $15,000—

"To be applied to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States, having due regard to the varying conditions and needs of the respective states or territories."

It is further provided that—

"No portion of said moneys exceeding five percentum of each annual appropriation shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation or repair of any building or buildings, or to the purchase or rental of land."

The Adams act, providing as it does for original investigations, supplied the greatest need of the Agricultural Experiment Station—means of providing men and equipment for advanced research. Only such experiments may be entered upon under the provisions of this act as have first been passed upon and approved by the Office of Experiment Stations of the United States Department of Agriculture.

Further support for the Agricultural Experiment Station was provided by

the federal government by the passage of the Purnell act, which was approved by the President February 24, 1925. This measure authorized an appropriation of $20,000 for the fiscal year beginning July 1, 1925, with increasing annual allotments of $10,000 until a total of $60,000 will be reached for the fiscal year beginning July 1, 1929. The law specifies that—

"The funds appropriated pursuant to this act shall be applied only to paying the necessary expenses of conducting investigations or making experiments bearing directly on the production, manufacture, preparation, use, distribution, and marketing of agricultural products and including such scientific researches as have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry, and such economic and sociological investigations as have for their purpose the development and improvement of the rural home and rural life, and for printing and disseminating the results of said researches."

The Purnell act, while specific in its statement of the purposes for which the appropriation may be used, is broad in scope and provides specifically for scientific research in agricultural economics, home economics and rural sociology, in addition to providing more liberal support for the older established work of the Agricultural Experiment Station.

More than one hundred projects, covering practically all phases of agriculture investigation, are being studied by the members of the Agricultural Experiment Station staff.

The farms, live stock, laboratories, and general equipment of the College are all directly available for the use of the Agricultural Experiment Station.

The results of the work of the Station are published in the form of bulletins, circulars, and scientific papers. These bulletins are of two classes—those which record the results of research work of a purely scientific character and those which present technical information in a simplified form, suitable for the general reader. The circulars are popular presentations of data which call for immediate application, as well as timely and useful information not necessarily new or original. The scientific papers are usually published as reprints or addresses given before scientific bodies. These reprints contain original information or report definite step in the progress of investigations under way.

All bulletins and other publications from the Agricultural Experiment Station are sent without charge to citizens of the state. Any person in the state who so desires may have his name placed on the permanent mailing list of the Station.

Letters of inquiry and general correspondence should be addressed: "Agricultural Experiment Station, Manhattan, Kan." Special inquiries should be directed, so far as possible, to the heads of departments having in charge the matters concerning which information is desired.

CONTROL WORK OF THE STATION

In addition to the work of agricultural investigation, the state has enlarged the activities of the Station along various lines of state executive or control work.

One of the important lines of control work is that of the State Entomological Commission. (Laws of 1907, ch. 386; 1909, ch. 27.) This commission, created in 1907, was established—

"To suppress and eradicate San José scale and other dangerous insect pests and plant diseases throughout the state of Kansas."

The professors of entomology at the Agricultural College and at the University of Kansas are by law designated as two of the five members of the above commission. Acting under the title of state entomologists, they divide between them the territory of the state, for the purpose of inspection.

They are empowered—

"To enter upon any public premises . . . or upon any land of any firm, corporation or private individual within the state of Kansas, for the purpose of inspection, destroying, treating, or experiment upon the insects or diseases aforesaid."

They may treat or cause to be treated "any and all suspicious trees, vines, shrubs, plants, and grains," or, under certain conditions, may destroy them.

They must annually inspect all nursery stock, and no nursery stock is to be admitted within the state without such inspection.

By legislative act (Laws of 1909, ch. 49), a "division of forestry" at the Agricultural College is also provided for in the following terms:

"For the promotion of forestry in Kansas there shall be established at the Kansas State Agricultural College, under the direction of the Board of Regents, a division of forestry. The Board of Regents of the Kansas State Agricultural College shall appoint a state forester, who shall have general supervision of all experimental and demonstration work in forestry conducted by the Agricultural Experiment Station. He shall promote practical forestry in every possible way, compile and disseminate information relative to forestry, and publish the results of such work through bulletins, press notices, and in such other ways as may be most practicable to reach the public, and by lecturing before farmers' institutes, associations, and other organizations interested in forestry."

It will thus be seen that the state of Kansas is making increasing use of the scientific staff of the Agricultural Experiment Station in matters of state importance requiring the application of technical knowledge.

Branch Agricultural Experiment Stations

FORT HAYS BRANCH STATION

The land occupied by this Station is a part of what was originally the Fort Hays military reservation. Being no longer required for military purposes, it was turned over to the Department of the Interior, October 22, 1899, for disposal under the act of congress of July 5, 1884. Through the influence of Senator, later Regent, W. A. Harris, and of Congressman Reeder, a bill was passed in the fifty-sixth congress setting aside this reservation "for the purpose of establishing an experimental station of the Kansas Agricultural College and a western branch of the Kansas State Normal School thereon and a public park." This bill was approved by the President on March 28, 1900. By act of the state legislature, approved on February 7, 1901, the act of congress donating this land and imposing the burden of the support of these institutions was accepted. The same session of the legislature passed an act providing for the organization of a branch experiment station and appropriating a small fund for preliminary work. In the division of this land, the College received 3,560 acres.

The land at the Fort Hays Branch Station consists mainly of high, rolling prairie, with a limited area of rich alluvium bordering on a creek, and is situated on the edge of the semi-arid plains region. It is well suited for experimental and demonstration work in dry farming, in irrigation, and in crop, forestry, and orchard tests, under conditions of limited rainfall and high evaporation.

The work of this Station may be divided into two divisions: (A) experimental projects, (B) general farm and live-stock work. The experimental projects are as follows: Dry-farming investigations, forage-crop investigations, cereal-crop investigations, forest, nursery and park demonstration and investigations, farm dairying, and experiments in the feeding and breeding of live stock. All this work is confined to the study of the problems peculiar to the western half of the state, and relates especially to crop production under limited rainfall, to the development of varieties better adapted to the climatic conditions there prevailing and to studies of the systems of animal husbandry and dairy husbandry suited to this region. The facilities of this Station are being used for the growing of large quantities of pure seed of the strains and varieties which have proved in actual test to be most productive in the western part of the state.

GARDEN CITY BRANCH STATION

In 1906 the county commissioners of Finney county purchased, for purposes of agricultural experimentation, a tract of land amounting to 320 acres, situated four and one-half miles from Garden City, on the unirrigated upland.

The land has been leased for a term of ninety-nine years to the Kansas Agricultural Experiment Station as an "experimental and demonstration farm," for the purpose of determining the methods of culture, crop varieties, and crop rotation best suited to the southwestern portion of the state, under dry-land farming conditions. A pumping plant irrigating from eighty to one hundred acres has been installed for the purpose of investigating the expense of pumping and the cost of equipment necessary for plants of this type, which are common in the shallow-water districts between Garden City and Scott City and along the Arkansas valley. The Agricultural Experiment Station's investigations in irrigation agriculture are centered at this branch station.

COLBY BRANCH STATION

The legislature of 1913 provided for the establishment of a branch experiment and demonstration station near Colby, in northwestern Kansas, "for the purpose of advancing and developing the agricultural, horticultural, and irrigation interests of this state and western Kansas." This Station was located upon a tract of three hundred and fourteen acres of land bordering upon the town site of Colby. This land was purchased by the county and deeded to the state for the purposes named above. Operations were begun in March, 1914. Cropping experiments are being conducted under dry-land conditions and under irrigation. Water is being lifted one hundred and fifty feet for irrigating a garden, fruit trees, and a few desirable crops, such as alfalfa, that could not be grown successfully in western Kansas with the natural rainfall. The primary purpose of the Colby Station is to determine the best methods of developing the agriculture of northwestern Kansas and to make it a still more desirable place to live.

TRIBUNE BRANCH STATION

At the Tribune Station experimental and demonstration work is conducted for the benefit of the surrounding territory. Special attention is paid to the problems of producing, storing, and utilizing crops for winter feeding of cattle which in summer graze the extensive range areas of the extreme western part of the state.

The Engineering Experiment Station

The Engineering Experiment Station was established for the purpose of carrying on tests and research work of engineering and manufacturing value to the state of Kansas, and of collecting, preparing and presenting technical information in a form readily available for the use of the various industries within the state. It is the intention to make all the work of the Experiment Station of direct importance to Kansas.

All of the equipment of the various engineering and scientific laboratories, the shops, and the College power plant are available for the work, while the personnel of the Station consists of members of the teaching staff from the various departments of the Division of Engineering and from other scientific departments whose work is directly related to the work of this division.

Among the investigations now being carried on are: Quality of concrete used in Kansas highway construction; farm sewage-disposal systems; radio activity of gas-well borings; Lewis factors for nonstandard gear teeth; durability tests of belt lacings or fastenings; tests of oil burners for house-heating boilers; study of automobile headlights; road material resources of Kansas; use of straw as fuel; *pisé de terre* construction; sweet clover harvesters; a small furnace for melting brass and aluminum; durability of concrete in alkali water; short-time strength test for concrete sands; study of tension and compression tests of cement and mortars; reduction of core losses in transformers on rural electric transmission lines; relation of electricity to irrigation; relation of electricity to dairying; relation of electricity to poultry production; relation of electricity to processing and handling of grain and forage; rural electrical laboratory; temperature investigations of floors for dairy barns; operation, care and repair of storage batteries; study of electric fireless cookers; the rural school house; the Kansas farm home; deterioration of concrete in silos; harvesting and storage of grain crops; volume changes in sand concrete; and reclamation of crank-case oils.

The testing laboratories of this Station have been designated by law* as the testing laboratories for the State Highway Commission and the state highway engineer, and as such have charge of the testing of all road materials for use in federal-aid road construction in this state.

The results of the investigations are published as bulletins and circulars of the Engineering Experiment Station, which are sent free to any citizen of the state upon request. Twenty such bulletins have been published and are now available. Besides issuing these bulletins, the Station answers yearly many hundreds of requests for information upon matters coming within its field.

Requests for bulletins and general correspondence should be addressed to Engineering Experiment Station, Manhattan, Kan. Requests for information in specific matters should be addressed, so far as it is possible, to the heads of departments in whose fields the particular matters lie.

* Sec. 5, ch. 64, Laws of 1917.

Bureau of Research in Home Economics

The Bureau of Research in Home Economics conducts investigations in the scientific, economic and social problems of the home. The purpose of this research is to discover new facts and new methods of the application of scientific knowledge bearing upon the welfare of the members of the family and the conditions under which they live.

The fields of research included in the bureau are: Child welfare, clothing and textiles, food economics, household administration, institutional economics, human nutrition, dietetics, and public health.

The laboratories of the Division of Home Economics include equipment suitable for work on certain of the problems. Opportunities for surveys and investigations of conditions in the state are found through the coöperation of various educational and social agencies.

The results of all investigations are published from time to time and are available on request to all citizens of the state.

The personnel of the bureau staff includes members of the teaching faculty in home economics. Several of the departments in other divisions of the College advise or collaborate with officers of the bureau on problems of related interest.

Among the investigations in progress are the following:

*Utilization by children of calcium and phosphorus from canned, dried, and fresh milk.

*Factors influencing the growth of children.

*Vitamin content of foods relating to human nutrition:

a. Fruits.
b. Vegetables.
c. Cereals.

Human utilization of the carbohydrates of parsnips.

Effect of freezing on the carbohydrates of the parsnip.

A study of the coefficient of protection of clothing fabrics.

*The screening action of fabrics against sunlight.

A study of costs of sickness to farm families.

The development of motor abilities of preschool children.

The effect of certain factors of nursery school environment upon the modification and development of definite personality traits.

The effect of cod liver oil on the erythrocyte count and the gastric activity of anemic college girls.

Age factor in the resumption of growth by stunted children.

Factors affecting seasonal variation of the growth of children.

* Those starred are being supported in part by funds from the Agricultural Experiment Station.

Special Courses

Short Courses in Agriculture

Farmers' Short Course

Kansas State Agricultural College offers in agriculture primarily a four-year curriculum, which gives the student fundamental training in the sciences relating to agriculture and their application to the production of crops and live stock, and to farming in general. Such a curriculum not only equips a man to become a successful farmer, but makes of him a better citizen, and a leader in the broader duties of life.

Many men who have chosen farming as their vocation, and who are alive to some of the advantages offered by this institution to the farmers of the state, are denied the opportunity of pursuing the College curriculum in agriculture, or even as much as one year's work in that curriculum. For such men the Agricultural College provides the Farmers' Short Course.

The course requires two years for completion, an eight-week term being given each year. For 1929 the session will begin Monday, January 7, and close Saturday, March 2. Besides the required subjects each student may take one or two elective subjects each year.

SUBJECTS IN FARMERS' SHORT COURSE

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and laboratory, respectively.

FIRST YEAR

REQUIRED

Soils and Fertilizers	4(4-0)
Live-stock Production I	5(3-4)
Dairying I	5(3-4)
Grain Crops	4(3-2)
Special Lectures	1(2-0)

ELECTIVE

Beekeeping	6(4-4)
Poultry Husbandry	3(3-0)
Fruit Growing	4(3-2)
Live-stock Sanitation	3(3-0)
Farm Management	4(3-2)
Farm Marketing	3(3-0)
Farm Accounting	3(2-2)
Farm Insects and Rodents	2(2-0)
Dairying II	5(3-4)
Gas Engines and Tractors	5(2-6)
Blacksmithing	2(0-4)
Carpentry	2(0-4)
Automobiles	5(2-6)

SECOND YEAR

REQUIRED

Forage Crops	4(3-2)
Live-stock Production II	5(3-4)
Farm Buildings and Equipment	4(4-0)
Farm Horticulture	3(2-2)
Special Lectures	1(2-0)

Any of the subjects listed in the elective work of the first year may also be taken as electives during the second year.

For each hour of recitation per week usually at least one hour of outside preparation is required. Laboratory or field work requires little or no outside

preparation. Each credit (standard for measuring the quantity of work done) represents not less than two hours' work per week for the entire eight weeks of the term. A regular, full-time assignment consists of not less than twenty credits, and students are usually not encouraged to take more than twenty-four credits.

CERTIFICATE. A certificate will be granted to each student completing satisfactorily the thirty-six credit hours of work required and not less than four credit hours of electives.

REQUIREMENTS FOR ADMISSION. This course is intended primarily for mature individuals. High-school work in the state is becoming so general and available to all communities that the demand for short-course work for boys of high-school age is being greatly reduced. Young farmers, not in school, are especially urged to consider the advantages of the Farmers' Short Course. Students over seventeen years of age are admitted without examination.

EXPENSES. There is no charge for tuition, but each student is required to pay, on enrollment, an incidental fee of $5, also a student-health fee of $1.50. This latter fee entitles him to free medical attendance by the College physician. In several of the laboratories, laboratory deposits or charges varying from 50 cents to $1 must be made to cover cost of materials used. In "Gas Engines and Tractors" and "Automobiles" the laboratory charges must necessarily be higher, being $3 and $2.50, respectively.

SELF-SUPPORT. The subjects of this course are primarily practical. They bring the student into actual contact with farm conditions and products. Besides the classroom work, many hours each week are spent in the stock-judging pavilion, laboratory, shop, and barn. This leaves the student but little time for outside labor, and students are therefore advised to come provided with as nearly all the necessary funds for the course as possible.

BRIEF DESCRIPTION OF THE WORK

SOILS AND FERTILIZERS. (Agron. 3.) Various soil types common in Kansas are studied, especially with reference to their economical management for the production of profitable crops and the maintenance of fertility.

LIVE-STOCK PRODUCTION I. (An. Husb. 6.) A study of the principles and practices of feeding and management of live stock. The laboratory time is devoted to judging market live stock.

DAIRYING I. (Dairy Husb. 1.) Farm dairying, including the composition and properties of milk, the feeding of the dairy cow, the selecting and breeding of the dairy herd, and dairy sanitation. The laboratory provides practical work with the Babcock tester, in the use of the farm separator, and in butter making. Deposit, $1.

GRAIN CROPS. (Agron. 1.) A practical study of grain-crop production. Laboratory exercises are given for the identification of different kinds of threshed grain and the determination of damage and market classes and grades. Charge, 50 cents.

SPECIAL LECTURES. One credit is given each year for attending these lectures. Among the speakers provided are members of the College Faculty, including the president of the College, and some outside, well-known agricultural leaders.

FORAGE CROPS. (Agron. 2.) A study of the distribution and production of important forage crops, especially for Kansas conditions. Practical exercises in identification are given in the laboratory. Charge, 50 cents.

LIVE-STOCK PRODUCTION II. (An. Husb. 8.) A study of the principles and practices in breeding, history of the development of the different breeds, and the pedigrees of noted individuals. Some time is given to the matter of fitting live stock for show and sale. The laboratory work consists of judging, breeding live stock and butchering and handling meats.

Farm Buildings and Equipment. (Ag. Engr. 2.) A study of the fundamental principles of farm building arrangement and construction, including barns, houses, hog houses, poultry houses, machine sheds, silos, cribs, and granaries. Particular attention is given to farm equipment, such as tillage, seeding, and harvesting machinery, both horse-drawn and power. Some time is devoted to concrete construction, farm water systems, sanitation, heating, lighting, and ventilation. Text: Ramsower's *Equipment for the Farm and the Farmstead.*

Farm Horticulture. (Hort. 1.) A study of the possibilities of the art of horticulture in creating better living conditions and better homes. Planning of the farmstead; the planting of ornamentals, wind-breaks, and forest trees; and the care of garden, small fruits, and the home orchard. Incidentally an attempt is made to suggest the possibilities of commercial horticulture in localities adapted to special crops.

Beekeeping. (Ent. 10.) The elements of practical beekeeping. Laboratory exercises consist of practice in constructing hives, supers, brood frames, comb-honey sections, extracting frames, and wiring frames; also of practice in putting in and embedding foundation. Practical demonstrations are given. The object of the work is to give such practical training as will prepare the student to engage successfully in beekeeping.

Poultry Husbandry. (Poult. Husb. 1). The practical phases of poultry management, including feeding, breeding, housing, incubation, and brooding.

Fruit Growing. (Hort. 2.) The principles that underlie the success of fruit growing. The work includes a discussion of soils and soil conditions; the possibilities of irrigation; the fruit varieties adapted to various locations; plans for planting and care of young orchards; formative pruning and the problems of protecting trees from insects and diseases; and the storage and marketing of fruit.

Live-stock Sanitation. (Vet. Med. 1.) A study of diseases that are communicable from animal to animal or from animal to man. The causes, symptoms and methods that are employed to prevent and to combat the spread of diseases, and the drugs that are commonly used as disinfectants, for washes, dips, etc., are given full consideration. The use of serums, vaccines, etc., for the prevention of diseases is considered. Methods of disposal of sick and dead animals as well as the means employed to clean and to disinfect the premises so as to prevent a recurrence of diseases are considered.

Farm Management. (Ag. Ec. 1.) In this class the work in the various agricultural subjects is correlated and placed on a practical workable basis. The principles of farm accounting, distribution of capital, laying out of fields, planning rotations, etc., are given first consideration. Charge, 50 cents.

Farm Marketing. (Ag. Ec. 2.) A study of marketing functions and services and means of improving the methods of marketing farm products. Considerable attention is given to coöperation as a means of improving the marketing of farm products.

Farm Accounting. (Ag. Ec. 3.) Records which the farmer should keep, methods of keeping these records, and ways of utilizing the information given by the records. Laboratory exercises deal with inventory, crop, live stock, labor, and other accounts, using figures obtained from Kansas farms. The practice work shows methods of keeping accounts and analyzing their results. Accounting forms and supplies for laboratory use are furnished the student. Charge, 50 cents.

Injurious Insects and Rodents. In this course methods of controlling serious insect pests of the farm, garden, and orchard, and those affecting domestic animals are discussed, emphasizing the importance of clean culture and good farm methods. The control of common rodents injurious to the farmer,

especially gophers, prairie dogs, rats, mice, moles, and rabbits, is given due emphasis.

Dairying II. (Dairy Husb. 3.) Keeping records and accounts of dairy-farm business; building up the dairy herd; dairy buildings and equipment; silos and silage; the dairy business and soil fertility; cow-testing associations; coöperative ownership of dairy sires; and detailed plans for the management of the dairy farm. Laboratory work consists of judging dairy cattle from the standpoint of economical production and breed type.

Gas Engines and Tractors. (Ag. Engr. 3.) A practical study of the principles and applications of the stationary gas engine and the tractor for farm use. Class work includes a study of tractor construction, operation, and repair, and of carburetion, ignition, lubrication, and cooling systems. A study is made of the repair jobs the tractor operator should be able to do himself. Text: Fraser and Jones, *Motor Vehicles and Their Engines.* Charge, $3.

Blacksmithing. A series of graded exercises or problems in blacksmithing closely related to farm work is given. Charge, $1.

Carpentry. The work begins with a few preliminary problems especially adapted to teaching the proper use of woodworking tools. This is followed by actual experience in the various phases of building construction. Charge, 75 cents.

Automobiles. This subject consists of lectures, discussions, and laboratory practice in the operation and care of automobiles from the standpoint of the owner. Instruction and practice are provided in adjusting bearings and ignition points, timing valves and spark, grinding valves, cleaning carbon, etc. Charge, $2.50.

Dairy Manufacturing Short Courses

Four dairy manufacturing short courses, each lasting two weeks, will be offered January 7 to March 2, 1929. The first course (January 7 to 19, inclusive) will be a general one devoted principally to the testing of milk, cream, and other dairy products. The course for the second two weeks (January 21 to February 2, inclusive) will be devoted to a study of market milk and cheese making. The third period (February 4 to 16, inclusive) will consist of intensive study and practice in butter making. The fourth and last two-week course (February 18 to March 2, inclusive) will be one in ice-cream making.

The work is so arranged that students can take one or more of the four courses, the full eight weeks of work making an intensive and practical commercial creamery short course. While, as a rule, it will be recommended that students take the entire course, the plan makes it possible for students in certain cases to take just the work that interests them most.

Admission. Any one not less than 17 years of age may enroll in any of these courses.

Expenses. An incidental fee of $5, a student-health fee of $1.50, and a laboratory fee of $2 will be charged all students enrolling for the eight weeks of work. For students enrolling for less than the entire course, an incidental fee of $3 will be charged and an additional laboratory fee of $2 for each two-week course taken.

Certificates. Students who complete the entire eight weeks of required work as here outlined, and who show satisfactory evidence that they have had six months successful creamery experience will be granted certificates.

OUTLINES OF THE COURSES

General Course in Milk and Cream Testing

JANUARY 7 to 19, 1929

LECTURES

Scope of Dairy Industry
Testing Milk
Milk Secretion, Composition, and Properties
Factors Affecting Composition
Sampling Milk and Cream
Cream Testing
Cream Separation and Farm Separators
Standardization of Milk and Cream
Testing Milk for Solids—the Lactometer and Its Uses
Bacteriology of Milk
Counting Bacteria in Milk
Keeping Milk and Butter-fat Records
The Butter Industry
Application of Babcock Test to Other Products
Acidity and Its Relation to Dairy Products
Kansas Dairy Laws
Clean Milk Production
Dairy Breeds
The Ice-cream Industry
Food Value of Milk and Its Products
The Market Milk Industry
Cheese and Condensed-milk Industry
Examinations

LABORATORY WORK

Milk Testing—the Babcock Test
Testing Milk of Different Breeds
Testing Skim Milk, Buttermilk, and Whey
Testing Frozen, Sour, and Churned Milk
Testing Cream
Study of Farm Separators
Standardization of Milk and Cream
Testing Milk for Solids and Adulterations
Separation of Milk
Plating Milk for Bacterial Counts
Farm Butter Making and Creamery Butter-making Demonstration
Testing Butter and Cheese for Fat
Testing Powdered Milk, Ice Cream, and Condensed Milk for Fat
Dairy Arithmetic
Testing Milk and Cream for Acidity
Dairy Farm and Plant Inspection
Demonstration in Freezing Ice Cream
Demonstration in Market Milk Handling
Demonstration in Cheese Making and Milk Condensing

A Course in Market Milk and Cheese Making

JANUARY 21 to FEBRUARY 2, 1929

LECTURES

History and Development of Market Milk Industry
Milk as a Food
Grades of Milk
Bacteriology as Applied to Market Milk
How to Produce Low-count Milk
Pasteurization of Milk
Cream Line Studies
Cultured Buttermilk
Chocolate Milk
Cottage Cheese and Soft Cheese
Milk Plant Equipment
Cheddar Cheese
Milk Ordinances
Condensed Milk and Milk Powders
Milk By-products
Types of Milk Plants
Milk Distribution
Adulteration in Milk
Cost of Milk Production
Examinations

LABORATORY WORK

Standardization of Milk and Cream
Receiving, Clarification, Pasteurization
Bottling Milk
Determination of Food Value by Fat and Solids Test
Determination of Cleanliness and Keeping Quality by Acid and Sediment Test
Plating Milk for Bacteria
Methylene Blue Test
Cream Line Studies
Making Starters and Cultured Buttermilk
Making Chocolate Syrup and Chocolate Milk
Making Cottage Cheese
Making Cheddar Cheese
Detection of Adulterations
Designing Milk Ordinances
Making Condensed Milk

A Two-week Course in Butter Making

FEBRUARY 4 to 16, 1929

LECTURES

History of the Butter Industry
Neutralization of Cream
Pasteurization of Cream
Churning Cream
Composition of Butter
Overrun in Butter
Cream Procurement
Cream Grading
Starter Making
Cream Ripening
Cream Station Operation
Market Grades of Butter
Butter Defects
Cream Separation
Bacteria and Their Relation to Butter Making
Yeast and Mold in Butter
Sweet-cream Butter
Factory Losses
Food Value of Butter
Marketing Butter
Examinations

LABORATORY WORK

Pasteurization of Cream
Analysis of Butter
Cream Grading and Testing
Preparation of Starters
Printing Butter
Churning
Cream Station Inspection
Judging Butter
Yeast, Mold, and Bacteria Counts
Receiving, Weighing, and Sampling Cream
Condensing Buttermilk
Flash Pasteurization
Sweet-cream Butter

A Two-week Course in Ice-cream Making

FEBRUARY 18 to MARCH 2, 1929

LECTURES	LABORATORY WORK
History and Development	Standardization of Milk and Cream
Composition and Properties of Milk	Preparation of Simple Mix
Testing Milk and Cream	Testing Mix for Fat
Testing Ice-cream Mix	Freezing Simple Mix
Standardization of Milk and Cream	Preparation and Freezing of Mixes with Varying Per Cent of Fat
Acid Test	Preparation and Freezing of Mixes with Varying Per Cent of Serum Solids
Ingredients Used in Ice Cream	Preparation and Freezing of Mixes with Varying Per Cent of Sugar
Composition of Ice Cream	Preparation and Freezing of Mixes with Varying Per Cent of Gelatin and Egg Yolk
Calculation of the Mix and Standardization	Use of Improvers
Processing the Mix	Preparation and Freezing of Ices and Sherbets
Freezing the Mix	Mojonnier Testing
Bacteria and Their Relation to Ice Cream	Preparation of Mixes in Vacuum Pan
Ices and Sherbets	Bricks and Fancy Molds
Fruit and Fancy Ice Cream	Preparation of Mixes from Butter and Powder
Refrigeration	Judging Ice Cream
Storage of Ice Cream	Study of Refrigeration Machinery
Gelatin and Egg in Ice Cream	
Flavoring Materials	
Food Value of Ice Cream	
Defects of Ice Cream	
Examinations	

One- and Two-year Courses in Trades Related to Engineering

The purpose of these one- and two-year courses is to give a practical working knowledge of one of the trades, and in addition to give work in shop arithmetic, shop drawings and other studies which are essential to its successful application. Each of the several courses is intensely practical, well rounded, and should prove profitable to all who desire a thorough training in a trade course. A certificate will be granted to each student satisfactorily completing the prescribed work. These courses begin and end on the same date as the regular College work as given in the College calendar on page 7.

It should be noted that for each hour of recitation per week at least one hour of outside preparation is required. Laboratory work requires little or no outside preparation. Each semester credit (standard for measuring the quantity of work done) represents not less than two hours' work per week for the entire semester. For Summer School each credit represents not less than four hours' work per week.

In general, students are required to take the subjects in the order outlined; however, if the conditions warrant, the order may be changed by the head of the department.

Substitutions will be allowed in certain cases where the conditions seem to justify it.

REQUIREMENTS FOR ADMISSION. Students entering any of the one- and two-year trade courses should be at least eighteen years old and should have completed the eighth grade in common-school education, or its equivalent.

Two-year Trade Course for Machinists

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and laboratory, respectively.

FIRST YEAR

First Semester		Second Semester	
Shop Calculations I		Shop Calculations II	
Shop 1	3(3-0)	Shop 2	3(3-0)
Shop Drawing I		Shop Drawing II	
Shop 3	2(0-4)	Shop 4	2(0-4)
Soldering and Babbitting		Machine Shop II	
Shop 20	2(0-4)	Shop 11	16(0-32)
Blacksmithing I			
Shop 21	2(0-4)		
Oxacetylene and Electric Welding			
Shop 24	2(0-4)		
Foundry I			
Shop 40	2(0-4)		
Machine Shop I			
Shop 10	6(0-12)		

SUMMER SCHOOL

Machine Shop III	
Shop 12	10(0-40)

SECOND YEAR

First Semester		Second Semester	
Shop Drawing III		Shop Management	
Shop 5	2(0-4)	Shop 7	3(3-0)
Machine Shop IV		Jig and Fixture Design	
Shop 13	18(0-36)	Shop 6	2(0-4)
		Machine Shop V	
		Shop 14	15(0-30)

SUMMER SCHOOL

Machine Shop VI	
Shop 15	10(0-40)

One-year Trade Course for Automechanics

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and laboratory, respectively.

First Semester		Second Semester	
Shop Calculations I		Shop Calculations II	
Shop 1	3(3-0)	Shop 2	3(3-0)
Shop Drawing I		Shop Drawing II	
Shop 3	2(0-4)	Shop 4	2(0-4)
Soldering and Babbitting		Shop Management	
Shop 20	2(0-4)	Shop 7	3(3-0)
Blacksmithing I		Automechanics I	
Shop 21	2(0-4)	Shop 30	13(0-26)
Oxacetylene and Electric Welding			
Shop 24	2(0-4)		
Foundry I			
Shop 40	2(0-4)		
Machine Shop I			
Shop 10	6(0-12)		

SUMMER SCHOOL

Automechanics II	
Shop 31	10(0-40)

One-year Trade Course in Blacksmithing

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and laboratory, respectively.

First Semester		Second Semester	
Shop Calculations I		Shop Calculations II	
Shop 1	3(3-0)	Shop 2	3(3-0)
Shop Drawing I		Shop Drawing II	
Shop 3	2(0-4)	Shop 4	2(0-4)
Soldering and Babbitting		Shop Management	
Shop 20	2(0-4)	Shop 7	3(3-0)
Blacksmithing I		Blacksmithing II	
Shop 21	2(0-4)	Shop 22	13(0-26)
Oxacetylene and Electric Welding			
Shop 24	2(0-4)		
Foundry I			
Shop 40	2(0-4)		
Machine Shop I			
Shop 10	6(0-12)		

SUMMER SCHOOL

Blacksmithing III	
Shop 23	10(0-40)

One-year Trade Course in Foundry Practice

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and laboratory, respectively.

First Semester		Second Semester	
Shop Calculations I		Shop Calculations II	
Shop 1	3(3-0)	Shop 2	3(3-0)
Shop Drawing I		Shop Drawing II	
Shop 3	2(0-4)	Shop 4	2(0-4)
Soldering and Babbitting		Shop Management	
Shop 20	2(0-4)	Shop 7	3(3-0)
Blacksmithing I		Foundry II	
Shop 21	2(0-4)	Shop 41	13(0-26)
Oxacetylene and Electric Welding			
Shop 24	2(0-4)		
Foundry I			
Shop 40	2(0-4)		
Machine Shop I			
Shop 10	6(0-12)		

SUMMER SCHOOL

Foundry III	
Shop 42	10(0-40)

BRIEF DESCRIPTION OF COURSES

Shop Practice Department

1. Shop Calculations I. 3(3-0). Mr. Sink.
Practice and use of the principles of arithmetic in the solution of shop problems, including information on various matters to which shop mathematics is applied.

2. Shop Calculations II. 3(3-0). Prerequisite: Shop I. Mr. Sink.
Continuation of Shop Calculations I, including problems and applications.

3. Shop Drawing I. 2(0-4). Mr. Sink.
Free-hand lettering, use of drawing board, T-square, and drawing instruments; the construction of geometrical figures, making orthographic projections and sections of simple objects.

4. Shop Drawing II. 2(0-4). Prerequisite: Shop 3. Mr. Sink.
Continuation of Shop Drawing I. Practice in the construction of orthographic and isometric projections, and sheet-metal drafting.

5. Shop Drawing III. 2(0-4). Prerequisite: Shop 4. Mr. Sink.
Working drawings from plates, free-hand sketches of machine parts and working drawings from these sketches.

6. Jig and Fixture Design. 2(0-4). Prerequisite: Shop 5. Mr. Sink.
Design of jigs and fixtures for machining interchangeable machine parts, empirical methods used to acquaint the student with the use of standard handbooks.

7. Shop Management. 3(3-0). Mr. Sink.
Problems of the shop foreman or owner, study of the selection, installation, and arrangement of equipment.

10, 11, 12, 13, 14, 15. Machine Shop I, II, III, IV, V, and VI. 6(0-12), 16(0-32), 10(0-20), 18(0-36), 15(0-30), and 10(0-20), respectively. Mr. Jones, Mr. Doelz.
Exercises to bring into use the various machines and practical work in the building of wood lathes; in making repairs on machinery, babbitting and fitting of bearings; aligning shafting and pulleys; lacing and fitting belts. More advanced work includes instruction on milling machines, universal grinders, and screw machines. Special work is given in tool making when the skill and accuracy for this class of work is acquired. Charge, $1.50 per credit.

20. Soldering and Babbitting. 2(0-4). Mr. Sink.
Instruction and practice in forming and soldering the common metals; the use of the different fluxes; proper pouring and fitting of babbit bearings. Charge, $1.50 per credit.

21, 22, 23. Blacksmithing I, II, and III. 2(0-4), 13(0-26), 10(0-20), respectively. Mr. Lynch.
Practice in forging operations; exercise in drawing, upsetting, welding, bending; instruction in the use and care of the fire and tools, drills, hammers, and other tools used in the trade. Charge, $1.50 per credit.

24. Oxacetylene and Electric Welding. 2(0-4). Mr. Lynch.
Instruction and practice in making different types of welds. Charge, $7 for 2 credits.

30, 31. Automechanics I and II. 13(0-26), 10(0-20), respectively. Mr. Sink.
A study of the mechanism, adjustments, materials of automotive construction; carburetion; cooling systems, and lubrication. The most important fundamental principles of electricity and magnetism are included in electrical work. Advanced work includes systematic trouble shooting. During the latter part of the course the students are allowed, when conditions warrant, to specialize in the work they expect to follow. Charge, $1.50 per credit.

40, 41, 42. Foundry I, II, and III. 2(0-4), 13(0-26), 10(0-20), respectively. Mr. Grant.
Bench, floor, and machine molding using a great variety of patterns; use of different kinds of sands and facings; open sand work, sweep molding, core making, and all important foundry operations. Repairing and operating of cupola and brass furnace, and practical work, such as found in a commercial foundry.
Selection of equipment and general foundry layout are considered. Charge, $0.75 per credit.

Degrees and Certificates Conferred

In the Year 1927

SPRING COMMENCEMENT, JUNE 2

DEGREES CONFERRED

HONORARY DEGREES

DOCTOR OF SCIENCE

Elam Bartholomew, M. S., Kansas State Agricultural College, 1898
Andrew Boss, Vice-Director, Minnesota Agricultural Experiment Station
Warren Knaus, B. S., Kansas State Agricultural College, 1882, and M. S., Kansas State Agricultural College, 1885

GRADUATE COURSES

MASTER OF SCIENCE

Harold Allen, B. S., University of Colorado, 1920
Ada Grace Billings, B. S., Kansas State Agricultural College, 1916
Kenneth Karl Bowman, B. S., Kansas State Agricultural College, 1926
Nina Browning, B. S., Kansas State Agricultural College, 1923
Charles Earle Burt, B. S., Kansas State Agricultural College, 1926
Aura Melvin Carkuff, B. S., Kansas State Agricultural College, 1925
Ida Alfreda Carlson, B. S., Kansas State Agricultural College, 1913
Evelyn Charlotte Colburn, B. S., Kansas State Agricultural College, 1925
Elizabeth Anna Cox, B. S., Kansas State Agricultural College, 1914
Earle Reed Dawley, B. S., University of Illinois, 1919
David Neill Donaldson, B. S., Kansas State Agricultural College, 1926
Charles Ranger Enlow, B. S., Kansas State Agricultural College, 1920
Walter Carl Farner, B. S., University of Wisconsin, 1925.
Chris Henry Ficke, B. S., Iowa State College, 1925
Ann Henshaw Gardiner, B. S., Teachers College of Columbia University, 1923
Mamie Grimes, B. S., Kansas State Agricultural College, 1920
Alice Tibbetts Harkness, B. S., Kansas State Agricultural College, 1919
Jane Gladys Hartley, B. S., Kansas State Agricultural College, 1922
Nelle Alice Hartwig, B. S., Kansas State Agricultural College, 1926
Earl Howard Herrick, B. S., Kansas State Agricultural College, 1926
Donald David Hill, B. S., Oregon Agricultural College, 1925
Charles Bannus Hudson, B. S., Kansas State Agricultural College, 1924
Donald Bryan Ibach, B. S., Kansas State Agricultural College, 1923
Frank Watkins Jobes, A. B., Southwestern College, 1926
Russell Marion Kerchner, B. S., University of Illinois, 1922
Charles Howard Kitselman, V. M. D., University of Pennsylvania, 1918
Carol Susan Knostman, B. S., Kansas State Agricultural College, 1922
Hoon Koo Lee, Graduate Tokyo Imperial University, 1924
Edward Henry Leker, B. S., University of Missouri, 1917
Ruth Engle Long, B. S., Kansas State Agricultural College, 1926
Etna Place Lyon, B. S., Kansas State Agricultural College, 1926
William Harold Metzger, B. S., Purdue University, 1922
George Montgomery, Jr., B. S., Kansas State Agricultural College, 1925
Marianne Muse, B. S., Kansas State Agricultural College, 1921
Margaret Alice Newcomb, B. S., Kansas State Agricultural College, 1925
Gilbert Fred Otto, A. B., Kalamazoo College, 1926
Kenneth Miller Renner, B. S., Iowa State College, 1921
Herbert Henry Schwardt, B. S., Kansas State Agricultural College, 1926
Homer Ohliger Stuart, B. S., Pennsylvania State College, 1925
Hazel Marie Sweet, B. S., Kansas State Agricultural College, 1923
Charles West Tozzer, B. S., Ohio State University, 1926

AGRICULTURAL ENGINEER

Kay Iverson Church, B. S., Kansas State Agricultural College, 1923

CIVIL ENGINEER

Harry Nelson, B. S., Kansas State Agricultural College, 1923

MECHANICAL ENGINEER

William Arthur Schuster, B. S., Kansas State Agricultural College, 1913

UNDERGRADUATE CURRICULA

Division of Agriculture

BACHELOR OF SCIENCE IN AGRICULTURE

Paul Albert Axtell
Guy Norveil Baker
B. Lowell Barr
T. Lovell Barr
Clarence Frederic Bayles
Guy Cecil Bigelow
Chris Ray Bradley
Horace Austin Brockway
Paul Orville Brooks
Carl Milton Carlson
Earl Francis Carr
James Park Caster
Stanley Caton
Ernest Iden Chilcott
Loren Le Roy Davis
Raymond Howard Davis
Oscar Kirk Dizmang
Vernett Edward Fletcher
John Charles Frey, Jr.
Claude B. Harris
John Harold Johnson
Kenneth Walden Knechtel
Ralph Waldo McBurney
Wilmer Johnson McMillin
Bernard Isaac Melia
Maurice Edwin Osborne
Stephen Martin Raleigh
Thomas Russell Reitz
Lloyd Edwin Rogler
Henry Charles Seekamp
Jacques Pierre Francois Sellschop
George Jost Stewart
Collins Walter Thole
Van Victor Venables
John Tanton Whetzel

Division of Engineering

BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING

Merle Willard Bloom
John David McKean
Major Floyd Mueller
Lowell Henry Paddack

BACHELOR OF SCIENCE IN ARCHITECTURE

Oscar Dewey Lantz
Charles Le Roy Marshall
George Waite Smith
Myron Homer Soupene
Francis Hall Wilkinson

BACHELOR OF SCIENCE IN ARCHITECTURAL ENGINEERING

Louis Edwin Fry

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Daniel Hall Forbes
Harry Joseph Isham
George M. Wiedeman

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Ray Adams
Carleton McCrary Barber
Ralph Elmore Brown
Rushton Gardner Cortelyou
David Emil Deines
Leo Arthur Dixon
Herbert Beals Evans
William Everett Gibson
Emery Chester Grove
George Thomas Harkins
Harvey Simon Johnson
Reuben Milton Johnson
Ralph Henry Rhoades
Arthur Newton Stewart
Paul Lloyd Stuenkel
Harold Hetherington Theiss
Harold Mansfield Weddle

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Robert Paul Aikman
Harris Franklin Blackburn
Everett Lewis Blankenbeker
Clarence Edwin Bohnenblust
Dee Bowyer
Edgar Davis Bush
Arthur Eugene Churchill
Floyd Archie Decker
John Dill, Jr.
Stanley Malcolm Fraser
Alvin Willis Hamilton
Ralph Theron Hermon
Leland Stanford Hobson
John Hyer
John Oscar Johnson
Brighton Anderson Kahn
Melvin Elwood Karns
Oswald Joseph Lacerte
Thomas Herman Long
Francis William McDade
Harold McNiff
Laurel Armstrong March
Kenneth Berkley Mudge
James Frederick Murphy
Harold Vernon Rathbun
William Elwin Rutherford
Oliver Delmar Schmidt
Ernest Roosevelt Siefkin
Clifford Harry Strom
Carman Carl Tate
Simon J. Tombaugh
Harry Edwin Tuthill
Leo Kenneth Willis
Lawrence Ewalt Woodman
John Yost

BACHELOR OF SCIENCE IN FLOUR MILL ENGINEERING

Duard Winfield Enoch
Glen Harold Stoffer

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Augustus Wells Burton
Howard William Garbe
Glenn Albert Kirk
Daniel Verne Meiller
Clarence Elmer Morlan
Roy Lee Roberts
Christian Elmer Rugh
John Rogers Stebbins
Rollo Evans Venn
Irvin Day Wright

Division of General Science

BACHELOR OF SCIENCE

Margaret Adams
Dorothy Marguerite Akin
Emma Wilhelmina Biddle
Daisy Deane Davison
Howard Robert DeRose
Rida Floy Duckwall
Joseph Edgar Durham
Vernon Daniel Foltz
Irma Rosetta Fulhage
Willard Le Roy Gillmore
Grace Darline Grinstead
Clarabel Grover
Carolyn Augusta Gruger
Lydia Alma Haag
Chester Whitten Havley
Alma Louise Hochuli
Mignon Corwin House
Raymond Edgar House
Mary Pinkerton Janes
Minnie Florence Johnson
Chester Bonds Keck
Albert Smith Kinsley
Paul Merville Larson
Ellis Buford McKnight
Frank Brenner Morrison
Ida Newton
Faith Noble
Mina Tess Novak
Mary Esther Nuttle
Loren Manuel Nuzman
James Ernest Payne
Zurlinden Lafayette Pearson
Georgia Gwendolen Persons
Edwin Emanuel Peterson
Mary Kathryn Pfeiffer
Cecille May Protzman
Geraldine Buenta Reboul
Myron Wesley Reed
Frances Maree Richards
Franklin Thomas Rose
Ralph Schopp
Mildred Caroline Sims
Edmund Lee Thackrey
Crystal Louise Wagner
Cloyce Herbert Watters
Ruth Violet Welsh
June Margueritte West
Earle Whitney Westgate
George Halbert Wishart
Iscah Marion Zahm

BACHELOR OF SCIENCE IN INDUSTRIAL CHEMISTRY

Lynn Harvey Bradford
Emery Jack Coulson
Ray Geddes

BACHELOR OF SCIENCE IN INDUSTRIAL JOURNALISM

Marjorie Eloise Ainsworth
Hilda Frost Dunlap
Gerald Emerson Ferris
Blanche Evans Forrester
John Frederick Lindquist
Alice Cecelia Nichols
Evelyn Stella Peffley
Lucile Elizabeth Potter
Agnes Jeanette Remick
Fred Merle Shideler
Harold Crane Spencer
Russell Ira Thackrey
Alice Louise Williams
Lawrence Warner Youngman

BACHELOR OF SCIENCE IN RURAL COMMERCE

Curtis Carpenter Alexander, Jr.
Paul Eugene Berger
Christian Norman Bressler
Aloysius Max Brumbaugh
Hazel Flossie Dalton
Margery Lois Dryden
Wilbert Garold Fritz
Charles Raymond Gilbert
Joe Douglas Haines
Clifford Andrew Hollis
Herschel Oden Morris
James Francis Price
Edna Marie Suiter
Alfred Henry Zeidler

BACHELOR OF MUSIC

Hazel Elizabeth Blair
Lillian Iva Carver
Opal Marion Endsley
Harry Emanuel Erickson
Ruth Marie Faulconer
Marjorie Minnette Fleming
Mary Clara Jackson
Mary Helen Jerard
Mary Hannah Johnson
Bertha Harriet Lapham
Blanche Lapham
Mildred Inette Leech
Vera McCaslin
Kathryn Elizabeth Rumold
Myron Edward Russell
Lucile Stalker
Elizabeth Reid Sutton

Division of Home Economics

BACHELOR OF SCIENCE IN HOME ECONOMICS

Edith Evelyn Ames
Marion Elizabeth Barbour
Nellie Mable Bare
Irene Bridget Barner
Helen Joy Batchelor
Mildred Hazel Bobb
Florence Marian Burton
Mary Ellen Collins
Mildred Kathryn Doyle
Pansy Elmina Dunlap
Bernice Eckart
Mildred Clara Edwards
Winifred Maude Edwards
Betty Esther Elkins
Olive May Flippo
Helen Jeanette Greene
Maude Rosaleen Greub
Leona Marie Hanson
Marion Brackett Harrison
Acsa Margaret Hart
Clara Shaw Herrick
Stella May Heywood
Dorothy Louise Hulett
Clara Bessie Huxmann
Frances Catherine Iserman
Maggie Lorene Jeffrey
Vivian Shade Jewett
Ruth Signe Johnson
Carrie Ida Justice
Ruth Maurice Kimball
Mary Doris Kimport
Venda Faith Laman
Ethel Iles McKeeman
Martina Martin
Meda Rea Masterson
Alice Elizabeth Miller
Hazel Geraldine Miller
Elizabeth Mills
Hazel Lee Moore
Ruth Moore
Una Morlan
Nancy Mary Mustoe
Joyce Meyers
Merle May Nelson
Mary Sophie Norrish
Helen Elizabeth Pattison
Esther Joan Rodewald
Lillian Mae Roush
Annalou Turner Rucker
Aldene Scantlin
Elizabeth Catherine Shaaf
Bertha Shuyler
Meredith Wilma Smith
Dorothy May Stahl
Maud Elizabeth Stitt
Helen Narissa Thompson
Mildred Bertha Thurow
Eunice Marie Walker
Vesta Marguerite West
Avis Wickham
Hypatia Jeanne Wilcox
Dorothy Evelyn Zeller
Elsie Theresa Zohner

Division of Veterinary Medicine

DOCTOR OF VETERINARY MEDICINE

Earl Francis Graves
Norman Hamilton Howell
Horace Arthur Mills

COMMISSIONS AWARDED

SECOND LIEUTENANT, OFFICERS' RESERVE CORPS

Ray Adams
Frank Newell Atkin
Carlton McCrary Barber
Harold Ralph Batchelor
Raleigh Marion Bishop
Everett Lewis Blankenbeker
Clarence Edwin Bohnenblust
Christian Norman Bressler
Hale Earnest Brown
Ralph Elmore Brown
Edgar Davis Bush
Clifton Andrew Byers
Harold Benjamin Carter
Ernest Iden Chilcott
Rushton Gardner Cortelyou
Clarence E. Crews
Joseph Isaac Dalrymple
Elmer K. Davis
Raymond Howard Davis
Rex Knaus Davis
David Emil Deines
Albert Ehrlich
Duard Winfield Enoch
Herbert Beals Evans
Orval Denton Evans
Howard William Garbe
Walker Leon Garnett
Ray Geddes
Earl Francis Graves
Lou Wesley Grothusen
Alvin Willis Hamilton
Adolph Helm
Ralph Louis Helmreich
Willard McIntire Hixon
Raymond Edgar House
Harvey Simon Johnson
Virgil Fletcher Kent
Oswald Joseph Lacerte
Aubrey Erskine Lippincott
Harold McNiff
Manie Herbert Meyer
Horace Arthur Mills
Frank Brenner Morrison
John Ross Moyer
Loran Albert Murphy
Will D. Nyhart
Henry Clayton Paulsen
Edwin Emanuel Peterson
Richard Henry Peterson
Frank Hoyt Purcell, Jr.
Myron Wesley Reed
Lois Thomas Richards
Martin Henry Roepke
Oliver Delmar Schmidt
Fred Merle Shideler
Ernest Roosevelt Siefkin
Glen Harold Stoffer
Russell Ira Thackrey
Forrest Barber Volkel
John Yost

CERTIFICATES AWARDED

CERTIFICATE IN FARMERS' SHORT COURSE

Tracy V. Boughton
George Theodore Carls
Russell Edwin Furbeck
Milton Wilber Geiger
George Lawrence James, Jr.
Lloyd Olen Johnson
Wallace Yale Mills
Paul Herman Wieland

CERTIFICATE IN DAIRY MANUFACTURING SHORT COURSE

Arthur Vinton Atkins

CERTIFICATE IN ONE-YEAR TRADE COURSE IN AUTOMECHANICS

Oscar George Rinkel
Renwick Henry Wilson

SUMMER SCHOOL COMMENCEMENT, AUGUST 3

DEGREES CONFERRED

MASTER OF SCIENCE

Melva Beatrice Bakkie, B. A., Iowa State Teachers College, 1925
Wilson Seymour Beardsley, B. S., Connecticut Agricultural College, 1926
Frank Otto Blecha, B. S., Kansas State Agricultural College, 1918
Orville Thomas Bonnett, B. S., Kansas State Agricultural College, 1918
Josephine Elizabeth Brooks, B. S., Kansas State Agricultural College, 1926
Harry Lewis Cole, B. S., Kansas State Agricultural College, 1912
Benjamin Randolph Coonfield, B. S., University of Arkansas, 1926
Howard Robert DeRose, B. S., Kansas State Agricultural College, 1927
Robert Alexander Esdon, B. S., Kansas State Agricultural College, 1903
John Erwin Foster, B. S., North Carolina State College, 1926
Ralph Leonidas Foster, B. S., Kansas State Agricultural College, 1922
Clara Belle Gray, B. S., Kansas State Agricultural College, 1926
Maude Rosaleen Greub, B. S., Kansas State Agricultural College, 1927
Lawrence Fennor Hall, B. S., Kansas State Agricultural College, 1923
Randall Conrad Hill, B. S., Kansas State Agricultural College, 1924
George Benjamin Kappelman, B. S., Kansas State Teachers College of Emporia, 1917
Ruth Marian Kell, B. S., Kansas State Agricultural College, 1925
Keith Walter Miller, B. S., Kansas State Agricultural College, 1923
Maria Morris, B. S., Kansas State Agricultural College, 1911
Bella Marie Nelson, B. S., Kansas State Agricultural College, 1918
John Thomas Pearson, LL. B., University of Kansas, 1916, B. S., Kansas State Agricultural College, 1922
Ira Lewis Plank, B. S., Kansas State Agricultural College, 1918
Benjamin Henry Pubols, B. S., Oregon Agricultural College, 1926
Harold Martin Scott, B. S., Oregon Agricultural College, 1924
Edna Brenner Snyder, B. S., Kansas State Agricultural College, 1912
Lloyd Ancil Spindler, B. S., Kansas State Agricultural College, 1926
Grace Ann Steininger, B. S., Kansas State Agricultural College, 1925
Hazel E. Thompson, B. S., Kansas State Teachers College of Pittsburg, 1919
Leon Vincent White, B. S., Kansas State Agricultural College, 1918
Gladys Pearl Winegar, Ph. B., University of Chicago, 1924

UNDERGRADUATE CURRICULA

Division of Agriculture

BACHELOR OF SCIENCE IN AGRICULTURE

Roy Raymond Cameron
Elmer LeRoy Canary
Max Edwin Crannell
Fred Herbert Daniel
Orval Denton Evans
Harold Irving Hollister
John Humphrey Kerr
Ralph Emerson Kimport
Bertie Ray Kirkpatrick
Paul Griffith Lamerson
John Duncan McGregor
Oleve Margaret Manning
Rochford Glenn Yapp

Division of Engineering

BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING

Laurence Elam Best
Daniel Wilson Teare

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Henry Clayton Paulsen

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Joseph Isaac Dalrymple
James Frederick Snyder

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Harold Ralph Batchelor
Harold Alexander Bredehoft
Harold Benjamin Carter
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DOCTOR OF VETERINARY MEDICINE

Ramon Alvarez Acevedo
Ellmore Franklin Sanders

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CERTIFICATE IN ONE-YEAR TRADE COURSE FOR AUTOMECHANICS

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Pedro Laguda
Ralph Melvin Meyer
Claude Raymond Courtney
Robert James McKee
Lewis William Shull

HONORS

PHI KAPPA PHI

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Benjamin Randolph Coonfield
Nelle Alice Hartwig
Gilbert Fred Otto
Maria Morris
Loyd Ancil Spindler
Gladys P. Winegar
Kenneth Karl Bowman
Mamie Grimes
Frank Watkins Jobes
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Carl Milton Carlson
Collins Walter Thole
George Jost Stewart
Raymond Howard Davis

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Clarence Elmer Morlan
Ray Adams
Stanley Malcolm Frazer
Ernest Roosevelt Siefkin
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Edwin Emanuel Peterson
Minnie Florence Johnson
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Rida Floy Duckwall
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Mildred Bertha Thurow
Elsie Theresa Zohner
Aldene Scantlin
Stella May Heywood
Merle May Nelson
Hazel May Dwelly
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Edith Evelyn Ames

Division of Veterinary Medicine

Earl Francis Graves

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(1927)

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†Oleve Margaret Manning

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*†Clarence Elmer Morlan
Louis Edwin Fry
Laurel Armstrong March
†Stanley Malcolm Frazer
†Ray Adams
Thomas Herman Long
†Ernest Roosevelt Siefkin

*Awarded high honors.
†Awarded honors at end of sophomore year.

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*†Ray Geddes
*†Bertha Harriet Lapham
*†Kenneth Allen Burge
Mary Pinkerton Janes
James Francis Price
†Mary Helen Jerard
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Albert William Miller
Clifford Charles Eustace
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Bruce Robinson Prentice
Ralph La Rue Miller
Charles Belgrove Olds
Horace John Reinking
Emerson George Downie
Arthur Elmer Dring
Walter Gordon McMoran
Homer Thomas Deal
Arthur Oran Flinner
Craig Evan Pickett

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Floyd Leslie Reed
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John Clarke Watson
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Elizabeth Butler
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Vivian Iliene Kirkwood
Hester Read Smith
Renness Irene Lundry
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Division of Home Economics

Esther Beatrice McGuire
Mattie Louise Morehead
Lucile Kathryn Rogers
Linnea Carlson Dennett
Flora Marie Deal
Marcy Marcella McQuiestan
Nellie May Hubbard

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*Awarded high honors.
†Awarded honors at end of sophomore year.

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